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# An Address

ON

# THE DECLINE OF INFECTIOUS DISEASE IN ITS RELATION TO MODERN MEDICINE*

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INFECTIOUS disease does not play the dominant part on the medical stage that it did a generation ago. Since then much knowledge regarding disease in the individual, rather than that of the mass, has been acquired. Nevertheless, the fact remains that, although the microbic aspect of disease has lost some of its stimulating influence on research, the organisms are still with us and cast their myriad shadows over every department and specialty of medical practice.

## THE ETIOLOGY OF INFECTIOUS DISEASE

Standing as we do at the end of half a century of work in scientific microbiology, we may well pause to consider the extensive spread and the depth of accurate information which stands to the credit of many workers since Pasteur, Lister, and Koch began their pioneer work. In 1876, Koch demonstrated the cycle of the anthrax bacillus from spore to spore in a drop of aqueous humour under a cover glass. In 1882, he announced the discovery and culture of the tubercle bacillus. In 1880, Pasteur began his work on chicken-cholera and anthrax vaccination. These discoveries represented the extent of our knowledge at that time regarding the cause of infectious disease. Since then great progress has been made in our knowledge of infectious disease. I need only mention the isolation and culture of many pathogenic micro-organisms; the study of the power of resistance to disease acquired by the body and of the antibodies associated with it; the rise of chemotherapy, and the development of our knowledge of the protozoa, and the world of ultra-microscopic infectious agents. Giving birth to these concrete achievements were the concepts, theories, and hypotheses which, in part true, and in part false, animated the workers. It may be well on this occasion to recall some of these guiding theories which have survived and form the foundation on which my subject rests.

## IMMUNITY

In the early days of the new era, infectious diseases were looked upon as straight contests between host and infectious agent. The micro-organisms entered, multiplied, and were checked and killed, or else the host succumbed. Now we know that in many cases a kind of equilibrium establishes itself, in which the micro-organism remains somewhere in the host, ready to multiply again when the host is off guard. In others, localizations occur in which the specific bacteria multiply and survive for a time. The victims of these conditions are now called "carriers." The concept of "the carrier" was

* The presidential address, somewhat abridged, delivered before the Congress of American Physicians and Surgeons, Washington, D.C., May 1, 1928. The complete paper appears in the September number of the *Journal of Preventive Medicine.*

developed chiefly with protozoan diseases. In the bacterial diseases it first took root when an intensive study of diphtheria developed as a result of the discoveries of toxin and antitoxin. So-called "focal" infections are types of this condition, and represent local forms of disease towards which the host is partially immunized. Bacteria, notably spores of anærobes, may maintain themselves for a time in the system without multiplying. They may enter through fresh wounds of the skin or mucous membrane, and the liver, draining the digestive tract, often contains organisms of intestinal origin. Such bacteria may serve to explain certain rare complications following surgical operations and urinary infections in the absence of other manifest causes. The concept of "the carrier" is thus a complex one, and involves as many possibilities as there are species of micro-organisms capable of surviving in the tissues.

No one subject in the domain of pathology appears to be of so much importance as the problems connected with the defence developed and maintained by the body against foreign living matter. The importance of this has been recognized from the very beginning of the bacteriological era. The remarkable success of Jenner's cowpox, long before any organized investigation of infectious disease had been started, stimulated Pasteur to undertake his studies in fowl-cholera and anthrax. Since that time there has been no end to the procession of methods for the protective inoculation against disease. Here, as in other fields, empiricism was in advance of organized scientific enquiry, and harvested some notable triumphs of permanent value.

It was in 1884 that Metchnikoff published his first paper on phagocytosis, as observed in a disease of a small crustacean (daphnia) occurring in an aquarium. He was able to watch the spores of the microbe, as they penetrated into the body, become surrounded and engulfed by these wandering cells. This new theory of cellular defence proved highly intriguing, and stimulated further investigation. The discovery of antitoxin as a purely humoural agent of defence in 1890 added to the interest, and gave rise to a controversy regarding the relative significance of these two theories. Since then we have learned that the processes started by invading organisms in the body form a series of highly complicated biological reactions, no one of which can be directly credited with being protective or offensive, since in every disease the cellular and humoural response must be specially analyzed and evaluated.

Phagocytic cells may take up bacteria in large numbers yet the process may prove fatal. Protozoa make a specialty of living within cells, both epithelial and wandering, during a portion of their cycle within the host. The phylogenetic significance of these groups of mobile and mobilizable cell-types was referred by Metchnikoff to ancestral processes of nutrition in very low forms. In the case of not a few of these invasive organisms the defending cells actually become a support and comfort to the enemy. At present, we are forced to acknowledge that, while we know a large number of interesting cellular and humoural actions and reactions, we have not yet learned to piece them together satisfactorily for any one disease.

Aided by studies in genetics we are beginning to understand that we cannot add to or subtract from the original dower of capacities we received from our ancestors. Medicine may assist greatly by determining the maximum capacity of these innate powers and furthering them by adequate stimuli. It cannot add to the capacity to produce protective bodies through vaccination, but it is in a position to stimulate and mobilize, by proper methods, primary latent protective energies. Fortunately, individuals of the same species do not differ among themselves to such a degree as to jeopardize current methods of mass vaccination, but it must always be borne in mind that towards any infectious disease a few individuals may be inadequately provided with protective capacity, even under maximum stimulation by vaccination procedures. It is still a question whether the immunity or susceptibility of individuals is correlated with any anatomical or physiological character. The impression acquired from experimentation is that relative susceptibility is a character by itself, and not predictable from any other bodily function.

It has been customary to speak of natural as distinguished from acquired immunity. Certain species are definitely immune to diseases to which other species succumb. This type of immunity is probably dependent on quite different factors from those possessed by resistant in-

dividuals of a susceptible race. In the latter the immunity appears to depend on the capacity of the individual to reproduce and mobilize certain protective antibodies quantitatively. In the naturally immune these are not needed. The term "acquired immunity" would appear to be misleading. Man and all susceptible animals have a certain fundamental resistance, even when the race has not been in contact with the specific micro-organism. What is really meant by the term is that the individual has simply strengthened or augmented his original resistance in the presence of specific infection.

As a corollary of the various established laws in immunology it has been generally accepted that the animal organism is a unity in its efforts to protect any tissue or organ. The effect of Jenner's local vaccine pustule must have forced this principle to the front long ago. With the development of our knowledge of immunology the fact has been accentuated over and over that any local multiplication of infectious agents spreads its influence through the entire system. A single small tubercle allergizes the whole body. Antibodies are poured into the blood so quickly that the higher local immunity produced by the inoculation can be distinguished only with great difficulty.

### VARIATIONS IN THE TYPE OF ORGANISM

Second in importance to the concept of immunity is that of the variability of micro-organisms. Shortly after their discovery wild theories arose about the changes which micro-organisms may undergo. To counteract these heterodox assumptions Koch and his followers became rather too rigid adherents of the theory of the stability of pathogenic materia, and time was required before the newer idea of variability got a foothold. Slowly facts accumulated proving that no pathogenic micro-organism was without variants. The source and origin of many varieties of the same species remained obscure. It was noted however that bacteria gradually lose their virulence, or mutate into almost non-virulent types, under conditions of artificial culture. Variations among pathogenic micro-organisms are probably induced in the human and animal body by meeting in the tissues a variety of opposing conditions to which they must adapt themselves.

It would appear that the infectious diseases of the human race probably originated in its animal ancestors, and passed on to primitive man and developed in an environment equivalent to that of human life. In the early history of man and his ancestors different infectious agents probably arose in different parts of the globe, and remained more or less confined on account of the limited capacity of man at that age for travelling long distances. Even migration and wars were slow in their progress, and diseased individuals were left behind or succumbed by the way. The discovery and use of any means of rapid transportation might have been highly destructive to the early races of mankind. It is to be remembered also that in those early days man lived in close contact with his domesticated animals. Even to-day, in the East, domestic animals are housed under living quarters.

In view of these facts, the question arises. "What are the possibilities for the appearance of new or modified types of infectious disease, when micro-organisms transferred to other species change their physiological characters, and, owing to this change, become infectious for man?" Changes in the host are probably responsible for the many micro-organisms closely related to one another but not absolutely identical. Thus the three races of tubercle bacilli have probably been derived from one ancestral type. An illustration of my theme is the recent and more or less sudden sporadic appearance of undulant or Malta fever at a distance from its supposed primary centre about the Mediterranean. Instances of this infection have been reported within recent years from various places in the United States, Denmark, Germany, and Rhodesia, while the number of cases in Italy and other endemic regions appears to have increased. How are we to account for this occurrence? The organism of Malta fever in goats has been recognized since 1889, and the closely related form producing abortion in cattle since 1897. Another race has been noticed in swine since 1914. It is my belief that this porcine variety has been developed from cattle in recent times in the middle west, as a result of the close association of the animals in their feeding grounds, and the adaptation of the bovine variety to the pig under certain unknown conditions. If the bovine variety is regarded as responsible for undulant fever in man, why is it that these cases in man have appeared only

within the past three or four years, whereas according to evidence developed in my laboratory this micro-organism was active in dairy herds as far back as 1893. It is probable that everyone who has drunk raw milk has ingested this micro-organism once or many times. It would therefore appear probable that the bovine organism is only feebly capable of multiplying in the human system, but the passage of this micro-organism through the pig has made it more virulent for man, and that some of this modified porcine type has got back into the udder of cows, and thus established small centres of human disease. If nothing had been known of the animal diseases furnishing this human infection we might have been led astray in our speculation and regarded it as non-infectious, and might have failed to turn to animals as the probable reservoirs of the organism.

Taking these facts into consideration we may visualize the possibilities for new diseases to appear. The cause of the decline of the epidemic form of infectious disease has frequently been referred to the gradual rise of specific resistance in the host as a result of mild infections. It has also been claimed that there are certain more highly resistant individuals who, being spared, transmit this resistance to their offspring and so build up an immune population. Populations exposed to a strange disease suffer in epidemic form. The population furnishing the infection may not even be outwardly diseased. In general, in the great epidemics which have spread rapidly over large areas of the earth's surface their causal organisms have a special history and have come from an environment different from that into which they are lodged when they produce their wide-spread effects. In some cases, too, virulent races of micro-organisms would appear to have become extinct because the host perished before the period of excretion began. Other microbic races may have then taken their place. As a result of an interaction between the cells and fluids of the host and the micro-organism virulence has become reduced, so that finally we get a slight rise of specific resistance in the general population, and also an adaptation of the microbic cause to living conditions in the new host, which means a virulence lowered to a certain equilibrium level. After this has been reached the disease may become endemic, with small epidemic outbursts from time to time. A gradual reduction in mortality occurs, in which economic and medical influences play a part. In this way, in my opinion, a modification of the epidemic virus takes place, and we meet with a more tractable, less destructive organism, which probably never returns to its original level of virulence. Viewed from this angle, the flora of the mucous membranes may be either the degenerated survivors of recent or ancient epidemic types, or else saprophytes adapting themselves to a parasitic state. Even the ubiquitous *B. coli* may have a history.

In discussing the factors that have led to a general decline in the mortality due to infectious disease three agencies are cited as claiming more or less of a victory: the changes in economic conditions; the application of medical science; and the interplay of natural forces, still largely unknown and not controlled by human foresight, which tend to raise the resistance of the host and reduce the virulence of the parasite.

Improvements in economic conditions provide the opportunity for a wider aseptic zone through personal cleanliness. Unfortunately, industrial changes lead to huge concentrations of the population, in which the individual zone is broken in upon. One result is a continuation and probable increase in respiratory affections. A decrease of intestinal infections has been accomplished through adequate water supply and the inspection of food. The sewage problem has been advanced but is still unsolved. So far we have only converted our water courses into open sewers, permitting occasional outbreaks of intestinal disease as a result.

In every detail of individual and communal life medical science has formulated protective devices to maintain health. Without the constant application of these medical and preventive safeguards the human race could not sustain itself. If it dropped to the level of animals in this respect its fate would be a reduction to animal density of population, or even worse, unless the race segregated itself into non-communicating groups. The number of diseases scattered over the globe is so great that free intercommunication on the animal level might bring so many to bear on the race as to make it impossible to continue its struggle against other natural injurious agencies.

An important function, which should not be

overlooked, is the isolation of the sick, to such an extent as to exterminate in many instances the infectious agent in the patient. How much is gained by this procedure it is difficult to state. Where the micro-organism represents a resistant type, as in tuberculosis, and where chronic carriers are the rule, the advantages of isolation and the destruction of the secretions carrying the virus consist in a reduction of the general level of infection and account for a large number of allergic individuals free from demonstrable lesions. This spontaneous vaccination in countries where such diseases prevail is probably a safeguard rather than a danger.

The value of medical science in all its forms is now so thoroughly established as part of our civilization that its loss would be disastrous, and would probably endanger the life of the social organization as at present constituted. Medical science and practice must go on and continue their evolution, parallel with that of human society, for we are perpetually mortgaged to maintain the barriers against our environmental enemies, until a world organization shall have recognized backward races as potential dangers, and as a consequence have brought the world population to a common hygienic and anti-parasitic level. The research laboratory must play a large part in the natural history study of disease, but it must subordinate its analytical tendencies to the broader view of the whole, and assist in the comparative study. Those of us who have followed the development of research over a considerable period of years have frequently been faced by the fact that what may be regarded as the luxury of one period becomes a necessity of the next. Coming generations will see established research stations in hitherto only partially explored territories, where living conditions will be created to make research not only possible but remunerative to medical science, and where all forms of disease will be objects of interest in view of their possible interrelations and the light that they may shed on our many still unsolved problems.

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On the important occasion of the delivery of this address, Dr. Theobald Smith was introduced by Dr. A. Mackenzie Forbes, of Montreal, who called attention in fitting language to the many activities of Dr. Smith in the field of science. Dr. Forbes said:—

Ladies and Gentlemen:

"By a curious turn of the wheels of fate, one of the greatest medical scientists whom America has produced is to be presented to an American audience by a subject of Great Britain. This but shows the catholicity—the universality—of the Medical Sciences. The speaker of the evening, Dr. Theobald Smith, the President of the Congress of American Physicians and Surgeons, is Director of the Department of Animal Pathology of the Rockfeller Institute for Medical Research, at Princeton. In 1886 Dr. Smith made the first experiments in immunity. These were followed by the work of Behring, Roux and others. Dr. Smith's study of Texas fever in 1889-1893 was not only a great advance in the science of protozoan disease, but it paved the way for the work on malaria by Patrick Manson, Ronald Ross, and Grassi. In 1893, he first published his studies on the bacillus of tuberclosis. In 1898 he made the first clear differentiation between the bovine and human types. He has taken an important and an active place amongst the students of tuberculosis ever since. In 1895, Dr. Theobald Smith began his contributions on the production of toxines and antitoxines in diphtheria and tetanus. Whilst engaged in this research he made those fundamental observations on anaphylaxis which were then called "The Theobald Smith Reaction." For forty-five years his activities in research in the field of science have been constant and productive of much good. His contributions to the literature of the medical sciences have been many and of the greatest importance. It is not the good fortune of many men to do one really great thing, but to how few men it is given to be the discoverer not only of many truths, but to have so inspired others that, through their labours, pain, suffering, and death have been minimized, and the world has been made a safer and a better place to live in. Ladies and gentlemen, may I present Dr. Theobald Smith."

# THE USE OF SULPHOCYANATE OF SODA IN HIGH BLOOD PRESSURE*

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THE question of high blood pressure has loomed very large in recent years in the mind of the profession and of the public, and often in the case of the latter an apprehension is aroused which frequently is quite unnecessary and may do much harm. The mere fact of a pressure being apparently too high does not mean that we should at once endeavour to lower it. It may be there for some good purpose; it may be compensatory and the *optimum* pressure for the individual. If we do succeed in reducing it in such a case the patient must be the loser. But there are certain cases where the rise, if associated with distressing symptoms, such as headache, dizziness, and even more serious ones, like passing aphasia or paresis, is serious, and here it is good treatment to try to lower it.

In every case of hyperpiesis it is well to regulate the environment, by enjoining mental and physical rest and relieving as far as possible all nervous strain; also to attend to the diet, reducing all substances which tend to raise the pressure. Beyond these measures it is only in those cases showing distressing symptoms that we should go further.

All cases of raised blood pressure fall naturally into three groups, and it is often possible, by a careful consideration of the history and by physical examination, to determine into which group a patient entirely or chiefly comes. These groups are, (1) Nervous; (2) Toxic; (3) Organic.

In a case where, in spite of careful regulation of environment and diet, the pressure remains elevated and there are symptoms, an endeavour should be made to lower the pressure. In emergencies, such as angina pectoris, one of the nitrites is usually used, often with immediate good effect, but in the more chronic cases certain drugs having a more prolonged action are often indicated, and it is with one of these, rather less known than most, that we will now deal. This is the sulphocyanate of sodium, potassium or ammonium, and it is with the first of these that we have chiefly worked.

*Read before the Canadian Medical Association Meeting, Charlottetown, P.E.I., June, 1928.

## HISTORY

The first work of interest in the use of the sulphocyanates was done by Claude Bernard[1] more than seventy years ago. He described experiments showing their toxic effects. He found the drug to be a direct muscle poison when given intravenously in large doses. It abolished muscular activity without producing any sensory changes. Six years later, Olliver and Bergeron[2] showed that the sulphocyanates had a toxic action when taken by the mouth as well as when given intravenously, but in the former instance much larger doses were required to produce similar effects. Dubreuil and Legros[3] repeated Bernard's work, and attempted to use the sulphocyanates as an antidote in strychnine poisoning, but with little success. Kollocke[5] showed that the cyanate was the active part of the salt in its effect upon muscle. Pauli[4], in 1903, found that the sulphocyanate ion had a maximum inhibiting effect on the precipitation of protein in series with iodine and bromine ions. This led him to try its effect as a sedative in comparison with the bromides. He gave daily doses of one gram (gr. 15) to neurasthenic, cardiac and tabetic patients. It was during this work that he discovered not only a sedative action but, what was more important, that some of the patients suffering from hyperpiesis were relieved of symptoms and showed marked reduction in blood pressure. Further contributions in regard to the toxicology and pharmacology were made by Lodholtz[6], and Edinger and Treupel[7]. Nichols[8], in 1926, reported a dozen cases of hypertension in which the blood pressure was well reduced under daily one-gram doses. He had used this treatment for fifteen years with constantly good results. The most recent report on sulphocyanate therapy comes from the Cornell Clinic. Under the direction of Dr. Gager[9], 35 cases were treated for high blood pressure with the potassium salt. He reports beneficial results, though he used much smaller doses than others had done, and, as will be seen later, our experience coincides with his.

### CHEMISTRY

The sulphocyanates as a group include the ammonium, potassium and sodium salts The sulphocyanate of soda, which was the substance that we used chiefly, is an alkaline, white, crystalline body, very soluble in water and alcohol. It occurs normally in body fluids and secretions, such as the tears, saliva, gastric juice and urine. It is produced by breaking down of proteins containing sulphur. It is believed to be formed in the salivary glands, excreted, swallowed and then absorbed into the system. The ordinary sulphocyanate content of the saliva is about 0.01 per cent, but this varies under different conditions; for example, it is decreased by the administration of iodine and increased by tobacco[8].

Sulphocyanates can be detected in the saliva, tears, or urine in dilutions of 1-10,000 by the addition of a drop or two of ferric chloride solution. The resultant colour is a dark red which decolourizes on the further addition of an excess of mercuric chloride. These colour reactions do not take place if the mixture is decidedly alkaline.

### PHARMACOLOGY AND TOXICOLOGY

Taken by mouth in a simple aqueous solution, daily doses of fifteen grains of sodium sulphocyanate are usually tolerated over a period of at least three weeks without any untoward result. Excretion takes place through the salivary glands, kidneys, and slightly in the stools. The saliva and urine show a marked increase in their sulphocyanate content while the drug is being taken, and this persists for several days after its discontinuance. That the drug is only slowly got rid of is also shown by the persistence of its therapeutic effects after it has been stopped.

As a result of the chemical action of the drug on the tissues, none of the sulpho-cyanate radicle is changed into the very toxic hydrocyanic acid. Both *in vitro* and *in vivo* the reverse change is readily effected, that is from hydrocyanic to sulphocyanic acid[8].

The minimum lethal dose in various animals is about 500 mg. per kilo of body weight. In a man of 154 lbs. this would be about 30 grams, or one ounce, and in the several fatal cases on record (all of them suicidal) the amount was always much greater than this.

Lodholtz[6] reports work of Monk, in which he showed the liver to be the storehouse of the sulphocyanates which had been given intravenously to animals. Some were also found in the spleen and the salivary glands. In the same paper Fenwick is stated to have found that the sulphocyanates varied according to the patient's state of health. They were greatly reduced in cases of malnutrition, old age, and the wasting diseases.

The mode of action of the sulphocyanates in reducing blood pressure is as yet quite obscure, and much of the pharmacological work in this direction has been contradictory. Claude Bernard's description of the drug as a muscle poison, when given in massive doses, suggests that in therapeutic amounts it may act as a vaso-dilator. Recent work by Major respecting the increase of guanidine bases in high blood pressure is interesting when we recall that Monk showed the liver to be the storehouse of the sulphocyanates. Does the sulphocyanate bring about a fall in pressure owing to its decreasing the guanidine bases? Sulphocyanates were shown by Edinger and Trepel to increase the urinary output of sulphur and nitrogen. Pauli suggested that they acted by reducing the calcareous deposits throughout the body. He was able to demonstrate this in patients who had calcareous deposits about the teeth. The sulphocyanates may affect the blood pressure in more than one way, and further work is required before we can know the exact mode of action of the drug in this respect.

### EFFECT ON NORMAL BLOOD PRESSURE

In our investigations into the action of the sulphocyanates we first studied their effects on individuals with normal blood pressures. Six persons with normal pressures were given sodium sulphocyanate in five-grain doses in water thrice daily after meals. They reacted by a fall in systolic pressure of from 15 to 30 mm. in the period of one week. When the pressure fell below 100 mm. the medication was stopped. They did not complain of any symptoms and were not aware of any change in their physical condition. The first patient recovered his former pressure of 130 mm. in one week. The second (Case 1) continued at a lower level for nine weeks and did not regain his former pressure of 135 mm. for three months.

#### CASE 1

A male patient, suffering from a spinal condition, confined to bed, but in good general health, was given 15 grains of sodium sulphocyanate per day for a week. His pressure had been fairly constant at 135-90 for the past two years. On the fourth day after starting the drug the pressure began to fall. On the sixth day it was 98-70 and the medication was stopped. The pressure showed a persistently lower reading (about 100 mm. systolic) for two months, and it was not until the end of the third

month that it regained its former level. He complained of no symptoms and was not aware of any change in his physical condition.

A third patient continued at a much lower level for several weeks and did not regain his normal pressure of 135 mm. for eight weeks. The other three all showed a considerable fall.

### EFFECT ON HEIGHTENED PRESSURE

In selecting patients for treatment we did not pick any particular class, but, rather, included the general assortment of high pressure cases that ordinarily present themselves for help at a general hospital clinic. Those complicated by any acute inflammatory condition, cardiac failure, or severe kidney disease, were excluded, and only those in whom the main feature was hyperpiesis were used. In all, some seventy cases have been studied. These were divided into three groups according to the dosage employed.

Group I.—In this group there were twelve cases, ten of them being bed patients. Before the medication was commenced they were kept for two full weeks in bed, to allow for any fall in blood pressure due to rest. Their pressures were taken frequently. They were then given five grains of sulphocyanate of soda thrice daily in water after food, and the blood pressures were recorded daily. Two were out-patients and their pressure readings were recorded three times a week. Eleven of the twelve showed some lowering in pressure, the length of time necessary to bring about a fall varying from thirty-six hours to one week. One patient, a case with cardio-renal damage, showed no change in pressure. The fall in the systolic pressure varied from 20 mm. to 80 mm. in one week. In two cases, with falls of 60 and 80 mm., there was some weakness and sense of fatigue, and in one instance there was nausea. These disagreeable symptoms lasted about six days, even after the medication was stopped. In several patients the blood pressure continued to fall for several days after administration had ceased. The most decided fall was in the systolic pressure, but in the majority of instances the diastolic was also lowered to some extent. The longest period which the pressure took to return to its former level after the drug was stopped was six weeks. Under a much reduced dosage it could be kept down.

Invariably with the reduction in pressure there was noted a diminution in tension, headache, and a disappearance of hot flushes and a lessening of nervousness. In several instances it was found that the drug produced a sedative effect, in that the patients said that they felt drowsy. Several of them, who had previously suffered from insomnia, were now able to sleep throughout the entire night. Case 2 is a typical example of this first group, *i.e.*, those taking the full dose.

#### CASE 2

Female, aged 65, who had had hypertension for at least three years, and suffered from headache, hot flushes and weak spells. During the last year the pressure had been 260-140 or thereabouts. On February 4th, 1928, she was given sodium sulphocyanate in five grain doses thrice daily. By February 11th the pressure had fallen to 200-100 and the drug was stopped. She complained of feeling tired. On February 18th the pressure was 184-110. She was feeling much better and completely free from her persistent headache. She continued at this lower level for several weeks and when it climbed to 220 mm. was put on a reduced dose of five grains of the sulphocyanate once daily, which again controlled the pressure and kept it below 200 mm.

Group II.—From the observations made on the first group we decided that one gram, or fifteen grains, a day was not necessary in the majority of cases. It was also felt that the reduction of dosage might eliminate any occurrence of untoward symptoms, such as those before mentioned.

This second group included twenty patients who were attending the out-patient clinic. Their systolic pressures varied from 160 mm. to 300 mm. Our aim was to bring about a moderate reduction in blood pressure, and then allow for a period of rest before again attempting to again reduce it. With this object in view we gave five grains of the drug twice daily, until the pressure showed a drop of 20 to 30 mm.; then gave them three to seven days' rest before resuming the treatment. In spite of the lessened dose four of the twenty patients felt some lassitude, but only to a slight degree, and this might be accounted for as being directly due to the fall in blood pressure. It was found that the pressure could be reduced to the desired level, as with a larger dose, but the reduction was more gradual. Two of the group showed a substantial fall in the systolic pressure which was not permanent, lasting only three to five days, even when the drug was continued for some time. Ten of the twenty showed very decided improvement. They were relieved of symptoms, such as headache, dizziness, etc., and the pressures fell as much as 100 mm. They were able to carry on without sulphocyanate for periods of time varying from two weeks to two months. Case 3 is an example of this group.

#### CASE 3

Female, aged 46, who had suffered from headache, hot flushes and nervousness for two years. Heart normal;

no albumen in the urine; but some degree of arterio-sclerosis. The blood pressure varied between 260 and 270 mm. systolic. On March 1st she was put on ten grains of sodium sulphocyanate a day. March 3rd, blood pressure 220-120; drug stopped. March 8th, blood pressure 204-120 and medication started again. March 17th, blood pressure 190-120. Drug reduced to five grains daily. A gradual fall in pressure occurred, and on March 27th this was 170-110; the patient felt better and was almost entirely relieved of her symptoms. It was found that a dose of five grains three times weekly kept her comfortable and controlled her symptoms.

While taking blood pressures a close watch was always kept on the pulse rate. Certain patients showed variations in this during treatment, but there was no evidence that this was due to the drug. The majority showed no change in the heart rate.

Group III.—In this group the dose used was only five grains daily. Some forty patients were so treated, some of them being private cases, but the majority were attending the out-patient clinic. No cases complicated with nephritis were used. Four had moderately severe arterio-sclerosis, and two of these had had slight strokes some months before coming under our care. Two were diabetics, and the remainder were toxic or nervous cases of unknown origin. They were all given five grains of sodium sulphocyanate once daily in water after the evening meal. A few were tried on divided doses of 2½ grains twice daily, with the same result. With this dose it usually required from eight days to two weeks before the systolic pressure fell to any extent. The results varied considerably but the pressure was lowered in every case in the group. In the arterio-sclerotic patients the main fall was in the systolic pressure, the diastolic remaining almost unchanged. In such patients we were unable to reduce the pressure more than thirty points, but there was a noticeable softening in the force of the beat as it came through. Two of the four in this sub-group were relieved of headaches; the others experienced no relief. The most gratifying results were obtained in the remainder of the group. The gradual fall in pressure was accompanied by relief of symptoms, such as headache, dizziness, nausea, and tension. The pressure in one case fell from 260 to 160 and in another from 240 to 150. Others showed a fall of from 200 to 140, and from 180 to 130. No disagreeable symptoms were induced. After such falls the dose was reduced to five grains every second day and in this way the excessive pressures could usually be kept in control. Cases 4 and 5 are examples of this group.

CASE 4

Female, aged 56, weighing 186 lbs. For the past year she had had headaches, hot flushes and shortness of breath on any exertion. The heart is enlarged; very little arterio-sclerosis; and no albuminuria. The blood pressure, taken on several occasions, was 190-98. On April 2nd was put on sodium sulphocyanate, five grains once a day. There was a gradual fall in pressure until April 24th, when it was 158-85. The dose was then reduced by half and continued until May 3rd when the pressure measured 138-75 and the drug was stopped. She was entirely relieved of all her symptoms and said that she "felt like a new woman." The pressure remained at the normal level for three weeks more and then commenced to climb again but was easily controlled by the drug.

CASE 5

Female, aged 46, housewife. She complained of dizziness, headache, and hot flushes for the past two months which were steadily getting worse. She was a large heavy woman; menopause more than seven years before. The blood pressure, taken on several occasions, was about 180-110. The heart was large; no murmurs heard; and no evidence of arterio-sclerosis. Urine, negative. On April 26th she was put on sodium sulphocyanate, five grains once daily. By May 5th the pressure had fallen to 140-90 and the drug was discontinued. She was greatly relieved of her symptoms and was sleeping much better. She did not require any further medication until May 29th, when a similar dose was given with similar results.

It happens that in the four high pressure cases given the patients were all females, but equally good results occurred in men.

While the number of patients treated in our series is only in the seventies, our results show that in the sulphocyanates we have a symptomatic remedy which may often be of value in a most distressing condition.

## CONCLUSIONS

1. Sodium sulphocyanate causes a fall in the blood pressure, especially in the systolic, with usually no change in the rate of the heart.

2. This fall occurs when the pressure is normal as well as when it is abnormally high.

3. In patients showing much kidney damage or arterio-sclerosis the effect is least evident but usually occurs to some extent.

4. The best results are obtained in the large class coming under the heading of "essential hyperpiesis."

5. The sulphocyanates have been observed to have a sedative effect and are often mildly hypnotic.

6. They are easy to administer, and not unpleasant to take in an aromatic mixture.

7. A dose of 2½ grains twice or thrice daily is sufficient to obtain the effects.

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# THE PREVENTION OF MATERNAL MORTALITY IN MANITOBA*

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NOT a little heart burning was caused by the appearance of the report, "Maternal Mortality in Canada," compiled by Dr. Helen MacMurchy, Chief of the Division of Child Welfare of the Department of Health, Ottawa, Canada. This official report, which appeared in February, 1928, showed that from July 1, 1925, to July 1, 1926, there were 1,532 maternal deaths and 237,199 births yielding a maternal mortality rate of 6.4 per 1,000 live births.

It will be observed that Manitoba has the unenviable position of having the highest rate 7.7 per 1,000 live births, followed by British Columbia, Ontario, and New Brunswick all with rates of 7 or over. So far as our province is concerned it appears to have been unfortunate in the period selected for review, as the rate, 7.7 maternal deaths per 1,000 live births, has never been reached before or since.

In Manitoba from 1921 to 1927 inclusive there have been 590 maternal deaths. The maternal death rate per 1,000 live births for Manitoba for the year 1927 is 4.8, or if three doubtful cases are included 5.0. This compares favourably with the rate of 7.7 for the period July 1, 1925 to July 1, 1926.

Let us try to think what is contained in this record of 1,532 maternal deaths in Canada in one year. Other physiological functions are performed for the benefit of the individual alone, but parturition is performed for the benefit of the race, and in performing it the mother hazards her health and even her life. How much, then, does society owe to mothers! What safeguards should be thrown about them in this high and holy duty! Yet in this age of our vaunted civilization four women in Canada per day die in childbed. The only disease that kills off more Canadian women between the ages of fifteen and fifty is tuberculosis, and the tuberculosis death rate is diminishing, while the puerperal death rate is stationary or even increasing. Compared with European countries, Canada's position is far from satisfactory. Were the maternal mortality rate in Canada the same as in Denmark or Holland one thousand of these lives would have been saved. Compared with Great Britain, Canada has half as many maternal deaths with less than one third as many births. There is no need to stress the tremendous tragedy revealed in these figures: the loss of women in the prime of youth and beauty; the desolate homes; the motherless children. Let us consider, rather, the causes of maternal deaths and how they may be prevented.

The International List of Causes of Death, now adopted by all civilized countries, lays down eight main causes of puerperal deaths:

1. Accidents of pregnancy, which include abortion, ectopic gestation, moles, hyperemesis, retroversion of the gravid uterus.
2. Puerperal hæmorrhage, including accidental hæmorrhage, placenta prævia, post-partum hæmorrhage, adherent placenta.
3. Other accidents of labour, such as Cæsarean section, application of forceps, rupture of uterus, difficult labour, abnormal presentation, shock.
4. Puerperal septicæmia.
5. Puerperal phlegmasia alba dolens; embolus; sudden death.
6. Puerperal albuminuria, and convulsions.
7. Following childbirth (not otherwise defined), including puerperal insanity.
8. Puerperal diseases of the breast.

In the figures under review, as given by Dr. MacMurchy, sepsis, or puerperal septicæmia, as in nearly all other countries, heads the list with

*Read before the North Western District Medical Society, Neepawa, February 28, 1928, and the Brandon and District Medical Association, April 30, 1928.

418 deaths, or 27 per cent of the total; hæmorrhage comes next with 357 deaths, or 23 per cent; toxæmia, including eclampsia, third with 344 deaths or 22 per cent; dystocia with 87 deaths, or 6 per cent; embolus, with 87 deaths; shock, with 63 deaths, or 4 per cent; ectopic pregnancy, with 33 deaths.

It must be conceded that, even with the greatest possible care, there is a certain inevitable risk attaching to childbirth. It has been calculated that this risk is 1 per 1,000 live births. The risk will vary with the accessibility of assistance during childbirth and the character of the assistance available. Thus in a well organized, thickly settled district, with good roads and means of communication, the inevitable risk will be less than when these conditions do not obtain. To some extent this explains the discrepancy between countries such as Holland and Denmark, on the one hand, and Canada on the other. Yet we cannot lay the flattering unction of difference in physical conditions too much to our souls. The difference between these countries and ours in the maternal mortality rates is too great to be thus easily explained away.

Let us review each of the causes of death and note what steps may be taken to ward off the threatening danger. Apart from criminal abortion and sepsis, abortions and moles do not carry a high mortality. How frequent abortion is, is not known. Compulsory notification of pregnancy, which would afford a means of determining the frequency of abortions, has been proposed but it is not likely to come into force. The best treatment of abortion is judicious conservation, with operative intervention only when part of the ovum is retained.

Of the varieties of puerperal hæmorrhage, post-partum hæmorrhage claims by far the most victims. Too often post-partum hæmorrhage results from improper treatment, especially in the third stage. There is a tendency among some medical men to pride themselves on the shortness of time required to complete a maternity case. No sooner is the child delivered than the unfortunate uterus is squeezed and rubbed over the vertebral column as over a washboard, the placental cord is pulled on, and in less than five minutes the placenta is away and the doctor walks off, leaving the nurse to deal with the hæmorrhage which, unfortunately, is only occasionally excessive, but practically always occurs. In a normal labour the third stage is the most important, so far as the obstetrician is concerned. No attempts should be made to massage the fundus except in cases of hæmorrhage, or to express the placenta until the placenta has completely separated from the uterine wall, and then expression should be attempted only during contraction of the uterus. Bleeding from the uterine sinuses is arrested by contraction and retraction of uterine muscle fibres, and exhausted muscles will not properly contract or retract. If there is any doubt as to the contractile and retractile powers of the uterus an intramuscular injection of pituitrin and aseptic ergot should be given as soon as the placenta is delivered. Accidental hæmorrhage is generally associated with toxæmia, and rise of blood pressure, or the appearance of albuminuria, should put the obstetrician on his guard. In placenta prævia the first "spotting" or small hæmorrhage is too often disregarded. No attention is paid until the case becomes one of desperate emergency. Cases of placenta prævia should be treated in the hospital, if at all possible. As soon as a definite diagnosis of this condition is made the pregnancy should be terminated.

With regard to operative measures in childbirth, there is reason to think that the adoption of Listerian principles and of anæsthesia, by making safer and less painful operations which formerly were rarely performed, has actually increased the risk in childbirth. Operative intervention is more frequently and lightly entered upon, not always because the doctor thinks there is an indication, but often in response to the pleadings of the patient and the relatives to "do something." Forceps should not be applied unless the well defined indications for their use are present. In the Winnipeg General Hospital the hypodermic needle has often replaced the forceps. A patient who has secondary uterine inertia is given 1-6 grain of morphine with 1-200 grain scopolamine. Sleep often follows and after waking the pains return and delivery is accomplished naturally. That it is possible to conduct even a teaching clinic with comparatively infrequent resort to operations is shown by the records of the public maternity ward of the Winnipeg General Hospital. In the period July 1, 1923, to Dec. 31, 1927 there were 2,203 deliveries with 171 forceps operations, or 7.7 per cent, and 49 versions, or 2.2 per cent. In this period there were 7 puerperal deaths, giving a maternal mortality of 3.17 per 1,000 deliveries, about half the rate for Canada at large. Pituitrin is never used in this clinic until the second stage is completed.

We know there is a difference of opinion on this point, but we feel safer when not using this potent drug during the second stage.

With regard to puerperal septicæmia there are two schools of thought, one contending that infection is always exogenous, introduced from without by hands or instruments; the other, that it is autogenous, the organisms being present in the patient's body. The truth lies probably between these extremes. Infection, no doubt, is usually introduced from without, but under certain circumstances germs within the vagina or elsewhere in the body may gain access to the uterine cavity and the blood stream. Prof. R. W. Johnstone[1] of Edinburgh, in a recent address, urged his hearers to cultivate the obstetric conscience. Every labour should be conducted on sound surgical principles. If these are followed, a simple technique, even with little equipment, will produce wonderfully good results. In 1927 the Victorian Order of Nurses in Canada attended 11,016 births. Their figures indicate an average of 2.5 maternal deaths per 1,000 living births where physicians were in attendance. At a conference on puerperal morbidity and mortality, called on the initiative of the British Medical Association on January 11 last, Dr. Leonard Colebrook[2] raised the question of the practicability of preventive immunization against the risk of puerperal infection. The hæmolytic streptococcus as the cause of puerperal fever has been known for many years, but the results of most workers along this line of inquiry have been negative. Certain experiments with vaccines have, however, been made abroad, for which encouraging results are claimed. Jotten, in Germany, starting with small doses of a vaccine found an increase in phagocytic power, and a steady decrease in the percentage of morbidity as the dose was given in larger quantities. However, it is certainly premature, at present, to suppose that the parturient woman can be successfully immunized, but the idea gives reason for serious thought.

The treatment of puerperal septicæmia is so unsatisfactory that every effort must be made to prevent it. In hospitals the investigation of every instance of post-partum elevation of temperature may reveal some focus of infection, such as a nurse or doctor with tonsillitis, sinusitis, or ozæna. In Manitoba, puerperal septicæmia is a notifiable disease, but very few of the existing cases are reported. Since October 1, 1926, in Great Britain, where notification of puerperal septicæmia has been in force for many years, an order has been made requiring notification of all cases of puerperal pyrexia. This is defined as follows: "Any febrile condition occurring in a woman within 21 days after childbirth or miscarriage in which a temperature of 100.4°F (38° Cent.) or more has been sustained during a period of 24 hours or has recurred during that period." The doctor is asked to state on the notification form whether he desires assistance, and, if so, whether in the form of a second opinion, bacteriological examination of blood or lochia, hospital accommodation, or trained nurse. The local authorities are urged to take steps to provide the necessary facilities.

The conditions classed under the heading "Puerperal Albuminuria and Convulsions" are responsible for many deaths. While we can never hope to be free of toxæmia, we can, with prenatal care, prevent a fatal termination in the majority of instances. The prenatal clinic at the Winnipeg General Hospital was established in January 1921, and since that time to December 31, 1927, 2,791 women have passed through the clinic. There have been many cases of toxæmia, but in no instance has a single patient who had prenatal care developed eclampsia, and, so far as I am aware, there has not been a single death from toxæmia among women who attended the clinic. Toxæmia rarely occurs as a bolt from the blue. In women who have regular routine antenatal examinations any increase in blood pressure above 140, or the occurrence of albuminuria or œdema, calls for treatment to be instituted at once. The time is coming when eclampsia will be ranked with typhoid fever as a measure of the ignorance of a community in matters of public health. Intelligent prenatal care should almost wholly prevent eclampsia. Toxæmia is particularly harmful to the fetus *in utero*, and early and adequate treatment may save not one life but two. A promising field of inquiry is opened up by a paper read before the Pennsylvania State Society on October 6th, 1927, by Harold A. Miller, M.D., and D. B. Martinez, M.D.[3], of the University of Pittsburgh. In this communication they reported a series of 122 eclamptic and pre-eclamptic cases treated with "Heparmone," a liver extract. No pre-eclamptic woman developed convulsions and 14 consecutive cases of eclampsia recovered except one who had convulsions five days before treatment and was *in extremis* when first seen.

Puerperal insanity is not a frequent cause of

death, but is a source of great anxiety to all concerned. The frequent connection between post-partum hæmorrhage or sepsis, on the one hand, and the onset of puerperal insanity, on the other, deserves to be noted.

Mastitis only rarely causes death of the mother, but may contribute to the death of the child through interference with breast nursing and the consequent risk of gastro-intestinal infection, and it may also be a factor in the production of cancer of the breast in later life.

All authorities who have investigated the problem of maternal mortality have stressed the outstanding importance of pre-natal care. Sir George Newman, the Chief Medical Officer of the Ministry of Health of Great Britain, states: "No sound progress can be made in the reduction of maternal mortality apart from ante-natal supervision. Such measures as inquiry into the previous obstetric history, the careful examination and control of the personal health, pelvic measurements, the estimation of disproportion between child and pelvis, and the determination of presentation, enable many risks to be foreseen and forestalled. Moreover, opportunity is thus afforded for the early recognition or treatment of concurrent conditions, such as toxæmia or venereal disease. It should become a matter of course and routine practice for every pregnant woman to place herself of her own accord, and at an early stage, under competent advice." (Maternal Mortality, 1924, H. M. Stationery Office). Dr. J. B. DeLee coined the phrase, "*Parturiens, ipso facto, est in periculo mortis.*" Prenatal care offers the only way out. With prenatal care there should be also post-natal care. Dame Janet Campbell in her government report, "The Protection of Motherhood," (London, H. M. Stationery Office, 1927), says, "The value of post-natal examination is not fully recognized. Every woman ought to be examined, say, four to six weeks after confinement to make sure that everything is normal, and no maternity hospital should be satisfied finally to discharge a woman without ascertaining that no damage has been done and that no pathological condition exists which could and should be repaired. If women leaving a maternity hospital, where the labour and puerperium have been under skilled supervision, are systematically examined, a certain number will always be found in need of gynæcological, or rather medical, treatment of some kind, and the proportion would unquestionably be higher among women delivered at home. If suitable treatment is sought without delay the patient may be saved much ill-health and physical disability, and may also be spared difficulty at any future confinement."

The value of a prenatal clinic in connection with a hospital is borne out by the following figures. In the Winnipeg General Hospital during the years 1917-1920 inclusive there were 2,480 live births and 25 maternal deaths, yielding a maternal death rate of 10.09 per 1,000 live births. In January 1921, a prenatal clinic was instituted. In the period January 1, 1921, to October 31, 1927, there were 5,444 live births and 28 deaths, yielding a maternal death rate of 5.14 per 1,000 live births. In other words the maternal mortality rate was almost cut in half after the institution of organized prenatal care. A post-natal clinic was instituted in this hospital on April 28, 1926, and has been doing valuable work.

So far we have considered the problem of maternal mortality from the standpoint of the relation of the medical attendant to the patient. What may be done by the State? First, existing regulations with regard to registration of births and deaths and the notification of cases of puerperal septicæmia should be strictly enforced. Secondly, in my opinion, it would be well to have an investigation made through the Department of Health in Manitoba into every maternal death. The occurrence of the outbreaks of puerperal infection in hospitals should also be investigated. The Hospital Committee of the Welfare Supervision Board, now in session, will, no doubt, consider the advisability of locating hospitals at strategic points in districts which at present are not served by existing hospitals. In some countries, such as Great Britain and Australia, maternity benefits are paid by the State. The province of Saskatchewan provides for a payment of $25.00 to mothers in destitute circumstances; $10.00 going direct to the mother and $15.00 to the doctor or hospital. In 1927, 443 mothers were assisted to the extent of $10.00 each; and 351 doctors, 6 nurses, and 11 hospitals received $15.00 each, making a total of $10,032.00. Whether these benefits fulfil the expectations, and whether this province should enter upon such a scheme, are matters for investigation and debate.

The community should have a direct interest in this problem of maternal mortality. The co-operation of Women's Institutes should be sought; municipalities should be urged to provide public

health nurses. The public health nurses of this province are keenly aware of the importance of the care of mothers and newborn children, and have already done much. Education of public opinion in the importance of the care of maternity is not altogether a simple matter, as maternal mortality is not a problem which easily lends itself to popular discussion and propaganda. Not only, points out Dame Janet Campbell, is it a subject which is difficult to present suitably to an unselected mixed audience, but it is important that the pathological aspect of midwifery should not be over-emphasized. Much valuable work may be carried out by societies and organizations which concern themselves with the welfare of women and girls. The formation of Little Mother classes should be encouraged. Many young mothers enter upon motherhood without any preparation for its highly important and manifold duties. If malpractice has slain its thousands, ignorance has slain its ten thousands. Before a woman can enter upon any other profession a long period of training is required, yet public opinion does not demand any training for these priestesses of the sacred fire of the home, with duties higher and holier than those of the vestal virgins of Rome. As Sir George Newman points out. "The social aspects of this maternity problem are even more important than its medical issues. For motherhood is not only the physical source of a people, but also one of the foundations upon which a nation is built. The only sound statecraft is to encourage and safeguard motherhood." (The Protection of Motherhood, 1927).

May I close with these moving words from Dr. Oliver Wendell Holmes in his epoch-making essay, "On the Contagiousness of Puerperal Fever," written in 1843, four years before Semmelweiss in Vienna brought home to men the great truth that puerperal fever was not a visitation of Providence, but was conveyed by the fingers of medical attendants to women in labour.

"It is as a lesson rather than as a reproach that I call up the memory of these irreparable errors and wrongs. No tongue can tell the heart-breaking calamity they have caused; they have bowed the strength of manhood into dust; they have cast the helplessness of infancy into the stranger's arms, or bequeathed it, with less cruelty, the death of its dying parent. There is no tone deep enough for regret and no voice loud enough for warning. The woman about to become a mother, or with her new-born infant upon her bosom, should be the object of trembling care and sympathy wherever she bears her tender burden or stretches her aching limbs.

The very outcast of the streets has pity upon her sister in degradation when the seal of promised maternity is impressed upon her. The remorseless vengeance of the law, brought down upon its victim by a machinery as sure as destiny, is arrested in its fall at a word which reveals her transient claim for mercy. The solemn prayer of the liturgy singles out her sorrows from the multiplied trails of life, to plead for her in the hour of peril. God forbid that any member of the profession to which she trusts her life, doubly precious at that eventful period, should hazard it negligently, unadvisedly, or selfishly."


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**Preparalytic Poliomyelitis.**—One hundred and six patients with poliomyelitis seen by W. Lloyd Aycock and Eliot H. Luther, during the first four days of the disease, in whom paralysis had not appeared, were treated by intraspinal and intravenous injections of convalescent serum. One of these patients, treated on the second day of the disease, subsequently developed paralysis and died. Of the remainder, 64 per cent subsequently developed paralysis. The average total paralysis in the treated series was 19, as compared with 63.6 in 482 untreated cases out of 1,023 non-fatal cases reported throughout the state in 1927. Of the treated patients, 5.7 per cent developed paralysis in the two severer grades, as compared with 46 per cent of the untreated group. Furthermore, the amount and severity of paralysis varied with the interval elapsing between the onset of the disease and the time of treatment, those patients treated on the first day of the disease developing much less paralysis than those treated on subsequent days. The inclusion, because of early diagnosis, of a relatively large number of mild types, which were missed in the general epidemic, might explain the more favourable results in the treated cases. However, an intensive study in one locality, where the conditions were favourable for the detection of such cases, did not give any evidence to justify such an assumption. The data in this report indicate a favourable effect of convalescent serum when administered in the preparalytic stage of poliomyelitis, as shown by: (1) a low mortality rate; (2) a low average total paralysis, and (3) a strikingly low paralysis of the severer grades.—*J. Am. M. Ass.*, 1928, xci, 387.

# DOUBLE AORTIC ARCH AND PULMONARY ATRESIA, WITH PULMONIC CIRCULATION MAINTAINED THROUGH A PERSISTENT LEFT AORTIC ROOT, IN A MAN AGED TWENTY-NINE*.

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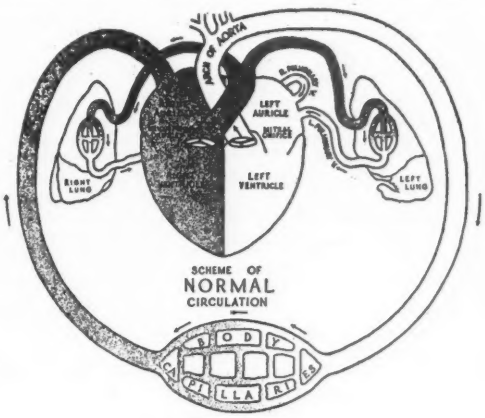
## I. CASE REPORT AND DISCUSSION OF EMBRYOLOGY (DIGBY WHEELER)

"The rarity of cardiac defects, the obscurity of their etiology, together with the fact that the cases are so often of serious clinical import, make the subject of congenital heart disease of the highest interest. Since the time of Senac[1] it has attracted the interest of many of the ablest workers in the field of cardiac pathology."

MORGAGNI,[2] William Hunter,[3] and Meckel[4] were among the first contributors in this field. Many cases have been described demonstrating cardiac variations. These have been reviewed by Abbott[5] in her classical monograph, from which the above quotation was taken. Of the 850 cases there analyzed 34 showed a pulmonary atresia, the blood usually reaching the lungs through the ductus arteriosus. In these cases of pulmonary atresia death usually occurred in infancy; the highest age recorded (Bach's[6] case) is thirty years.

Dextroposition of the aorta is one of the commonest anomalies, as is evident from the series cited by Arkin.[7] Pulmonary atresia and dextroposition of the aorta are both demonstrated in the case we are presenting but we believe this case to be unique because it shows many other marked deviations from the normal. It is unique, also, in that the man lived to the age of twenty-nine, with the aeration of his blood maintained by what we believe to be hypertrophied branchial arteries, branches of an aortic root. The degree in which this case




Normal conditions.

FIG. 1.—(From Abbott and Dawson.[8])

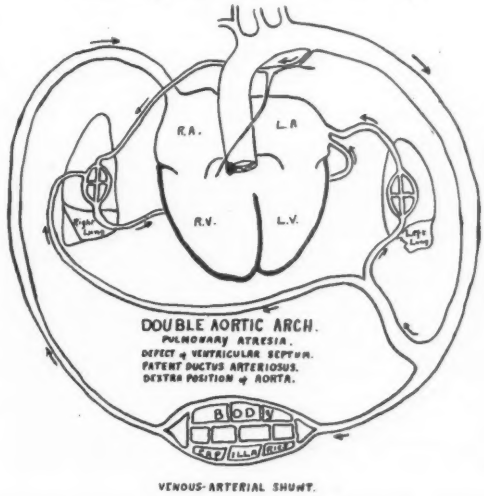



FIG. 2.—(Modified from Abbott and Dawson.[8])

* From the Anatomy Department, University of Manitoba.

† Presented at the 20th annual meeting of the American and Canadian Section of the International Association of Medical Museums held at Rochester, N.Y., April, 1927.

deviates from the normal is illustrated by Figs. 1 and 2, which have been modified from those given by Abbott and Dawson[8] in their valuable classification.

## CASE REPORT

R. B., male, aged 29, was admitted to King Edward Memorial Hospital, Winnipeg, on February 10, 1926, with a diagnosis of pulmonary tuberculosis and congenital heart disease (right ventricular hypertrophy, probably interventricular communication).

Between the years 1913 and 1926 he had been treated at intervals in the Winnipeg General Hospital as an out-patient and as an in-patient. Complete general and special cardio-vascular examinations were made.

*Family History.*—Father died at 46, of a "chest condition"; mother died at 36, of dropsy." Two sisters were alive and well; one sister died from an unknown cause; two brothers died in infancy from an unknown cause; and two brothers, aged 20 and 40 respectively, were alive and well.

*Personal History.*—He was born on the boat coming to Canada, of Polish parents. He was never able to do much work on account of his heart condition, and had always been receiving medical attention. He always slept 7 to 8 hours nightly (with three pillows); his general activity was much restricted. He did not use alcohol or tobacco. Small-pox in 1910.

*Present Illness.*—In 1914 he was in the Winnipeg General Hospital with a sore back. Following his discharge he felt weak and became tired easily. He was unable to take part in any of his former outdoor activities. This continued until 1918 when his feet began to swell and ulcers appeared on his legs. As these healed, others came. From 1923 his weakness gradually became more marked and he was unable to do any work. In the summer of 1924, following some over-exertion, he had a chill. A few days later he began to cough. The cough was slight at first and non-productive.

EXTRACTS FROM WINNIPEG GENERAL HOSPITAL HISTORY

"A striking feature was the marked clubbing of the fingers and toes. The nose was bulbous and the lips pendulous. Cyanosis was extreme, the entire body being of a muddy, bluish colour. The apex beat (maximum impulse) was 5¼ inches from median line, in the sixth left interspace. The outer point of impulse was 5¾ inches from the median line in the sixth interspace. Systolic and faint diastolic murmurs were audible. The maximum systolic murmur was just to the left of the sternum, in 3rd and 4th intercostal spaces. The artery walls were not palpable. Pulse, 70-90, was small, regular, not collapsing nor showing any deficit. Polycythæmia was marked, the red blood count varying from 10,160,000 to 8,500,000; hæmoglobin, 100 per cent. The Wassermann was negative. Urine, negative. No record of blood pressure findings. An electrocardiogram (Fig. 3), taken August, 1924, showed the following peculiarities:—

"First lead, exaggerated 'S' wave. Second lead, negative. Third lead, sharp inverted 'T' wave. Right ventricular preponderance.

"The condition was diagnosed as that of 'congenital heart, with probably interventricular communication.' (Dr. A. J. Burridge)."

A radiogram, taken December, 1925, is shown in Fig. 4.

The report of the radiographer (Dr. J. C. McMillan) was that the heart and great vessels showed marked increase, and that there were definite changes in the lungs suggesting tuberculous lesions. It is to be regretted that a fluoroscopic examination was not made nor a left anterior oblique plate taken, because the writers are satisfied that the presence of an anomalous right arch would have been demonstrated.

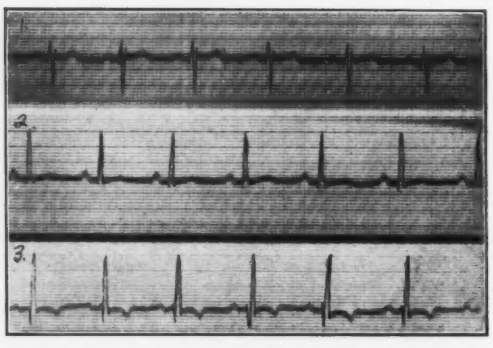



FIG. 3.—Electrocardiograph tracing. (Retouched to facilitate reproduction).

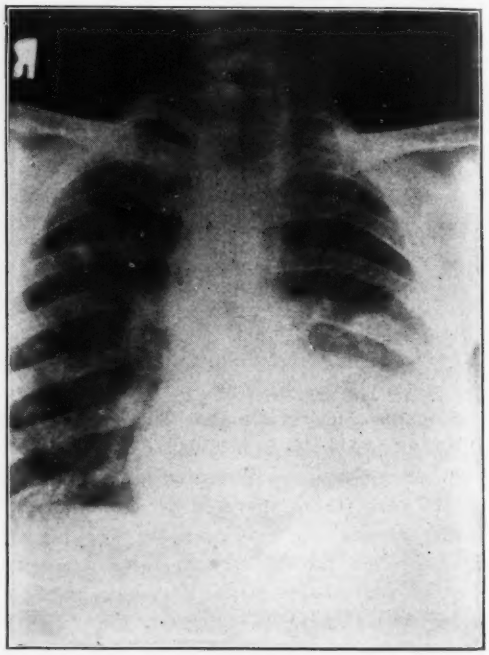


FIG. 4.—*Radiogram.* Marked increase in the size of the heart both to right and left, and of great vessels to right of median line. Enlargement of the shadow at hilum of right lung (Assman's sign), indicating dilated pulmonary vessels.

During 1925 the severity of the cough increased, with considerable expectoration. During the last three months expectoration amounted to half a box per day, with a large amount of blood. The loss of weight was rapid. He reported to the Winnipeg General Hospital where his sputum was found to contain tubercle bacilli. He was therefore transferred to King Edward Hospital.

The history on admission to King Edward Hospital showed that he had had a cough for one year, with expectoration for the last three months; he spat up three or four mouthfuls of blood every time he coughed. He had lost twenty-five pounds in the last two years; weakness and malaise had been progressively worse since 1914; he had had dyspnœa for as long as he could remember; cyanosis; clubbing of the fingers and toes; and palpitation.

Examination there showed marked cyanosis and clubbing of the fingers; weight, 150 pounds; height, 5 ft. 6 inches. His condition was diagnosed as that of an advanced pulmonary tuberculosis, showing marked involvement of the right upper lobe, with some dullness over the left upper lobe and late post-tussic crepitations on both sides. He died August 12, 1926.

*Post-Mortem Examination.*—The general characteristics were as previously noted in the history. Especially marked were multiple scars from old ulcerations on the legs, and the clubbing of the fingers and toes. On removing the sternum one was impressed with the width of the pericardial sac. Both pleural cavities were obliterated and in the right there was extensive fibrous adhesion. Both lungs showed old tuberculous lesions. there being cavitation and scarring in both apices. An extensive miliary tuberculosis had invaded the remaining parenchyma of both lungs.

HEART AND GREAT VESSELS: The heart was a large muscular organ and one was impressed by the degree of ventricular hypertrophy, the transverse diameter being 12 cm. and the distance from coronary sulcus to apex 10 cm. The muscular portion appeared to be composed of both ventricles equally, separated by a prominent interventricular sulcus. Arising from the base of the heart only one great vessel was to be seen, which measured 3.5 cm. in diameter. This vessel curved to the right, giving off in the following order the left innominate, right carotid and right subclavian arteries, and descended on the right side of the vertebral column behind the right bronchus. The pulmonary stem was not present. The arteries entering the hila of both lungs were seen to be branches from a trunk which arose from the descending portion of the aorta. This trunk passed upwards from behind the right bronchus. An additional small artery arose below this trunk from the anterior aspect of the aorta, and passed to the lower lobe of the left lung. A large thin-walled, trumpet-shaped vessel emerged from the left posterior wall of the right aortic trunk, the size of its communication with the aorta being 0.5 cm. in diameter, and flared out to empty into the hilum of the right lung. The venous return from the lungs and the systemic return to the heart were normal. The heart when opened showed marked hypertrophy of the ventricular walls, the right being 2 cm. and the left 1.5 cm. thick. The two ventricles communicated freely with each other over the top of the interventricular septum, which presented a smooth upper margin, completely covered with endocardium. Arising from the base of the heart above the upper free border of the interventricular septum was the thick-walled aorta. The left atrium was normal in size; the right atrium was greatly dilated.

Spleen, weight 450 grm. Liver, weight 2,200 grm. Kidneys, weight 220 grm. Remaining viscera negative.

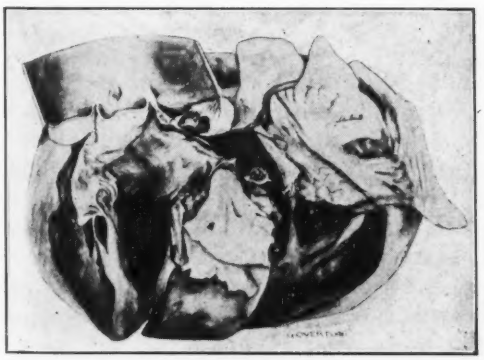


FIG. 5.—The heart laid open from behind. The thick-walled ventricles and interventricular septum are clearly seen. Note the hæmatoma on the aortic cusp.

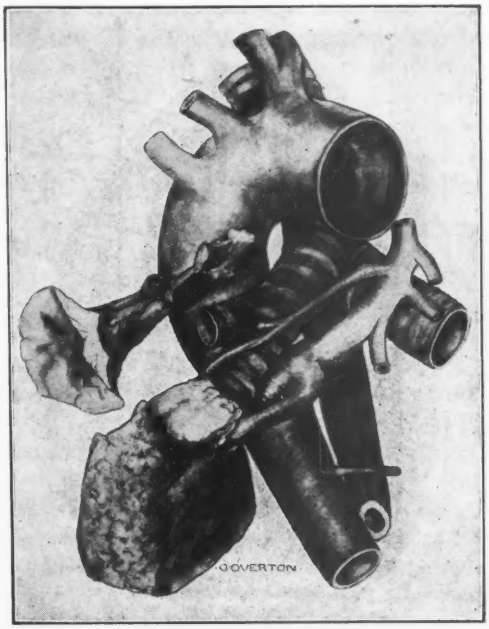



FIG. 6.—The aorta, trachea, and œsophagus. Note the trunk (left aortic root) arising from the descending aorta giving branches to hila of lungs. The communication between the dilated right pulmonary artery and the aorta by means of the minute ductus arteriosus can be seen. A portion of the right lung and an enlarged hilum gland are present.

## EMBRYOLOGY OF THE CONDITION

The embryological explanation of these anomalies is of interest.

In the human embryo there develop six branchial arteries which pass dorsally. These arteries when fully formed are arranged as illustrated in Fig. 7.

The next step in development is the disappearance of the vessels of the first arch. A little later the second branchial vessel also degenerates. Then that portion of the dorsal trunk which intervenes between the third and fourth branchial vessels disappears, so that the dorsal trunk anterior to the third branchial arch is cut off from its connection with the dorsal aorta and forms, together with the vessel of the third arch, the internal carotid. The ventral trunk anterior to the point of origin of the third vessel becomes the external carotid, and the portion intervening between the third and fourth vessels becomes the common carotid. The rudimentary fifth vessel vanishes, as did the first and second, but the fourth persists to form an aortic arch, there being at this stage in development two complete aortic arches. From the sixth arch the pulmonary arteries are de-

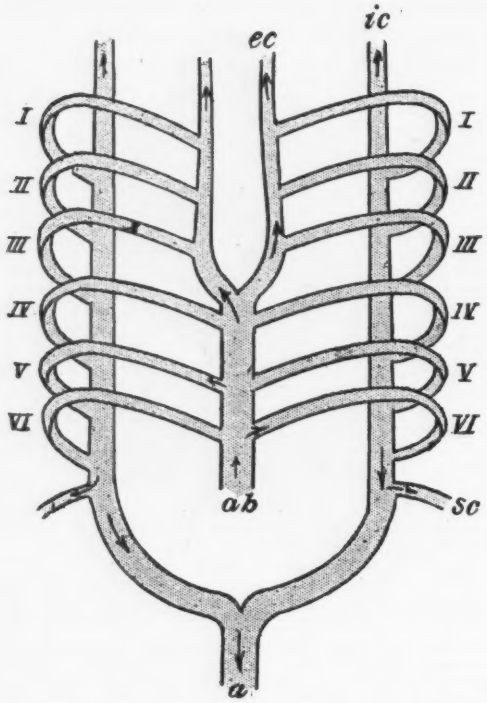



FIG. 7.—Diagram illustrating the primary arrangement of the branchial arch vessels.

a, Aorta; ab, aortic bulb; ec, external carotid; ic, internal carotid; sc, subclavian; I-VI, branchial arch vessels. (After McMurrich).

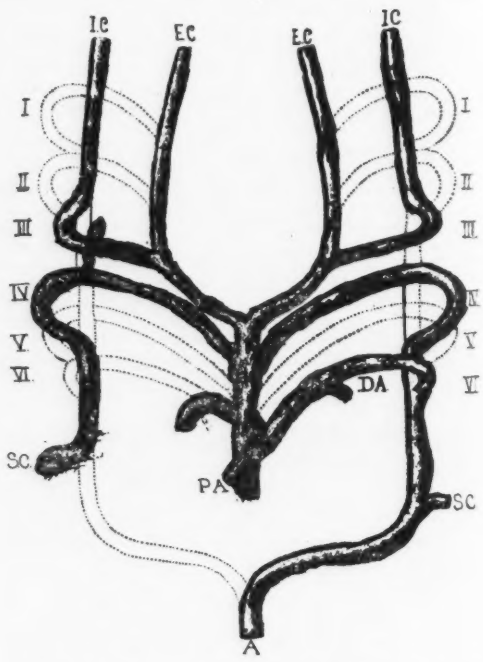



FIG. 8.—Diagram illustrating the changes in the branchial arch vessels.

A, Aorta; DA, ductus arteriosus; EC, external carotid; IC, internal carotid; PA, pulmonary artery; SC, subclavian; I-IV, aortic arch vessels. (After McMurrich).

rived. That portion of the right sixth arch which intervenes between the point of origin of the pulmonary artery and the right aortic arch disappears, while the corresponding portion on the left side persists until after birth, forming the ductus arteriosus, as shown in Fig. 8.

A comparison of Fig. 9 (R. B.) with Fig. 8 (normal) illustrates well the unusual arrangement of the arches which were present. The right aortic arch has persisted and it therefore gives rise to the following branches, a left innominate, a right common carotid and a right subclavian. The distal portion of the left aortic arch has disappeared. The proximal portion of the left aortic arch has persisted and from it are given off numerous branches which pass to the hila of both lungs, and are responsible for the aeration of the blood. We believe that these branches are in reality hypertrophied bronchials. Meckel first suggested the possibility that dilated bronchials might replace pulmonary arteries when the ductus arteriosus was completely closed.

The sixth branchial arch is of interest. There

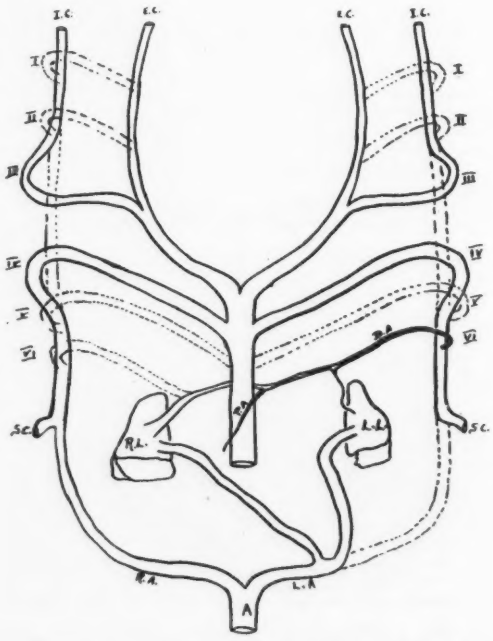



FIG. 9.—The variations of branchial arch vessels in R. B.

is complete pulmonary atresia. The ductus arteriosus has persisted and maintained a very small opening with the arch of the aorta. This passes to the right and becomes continuous with a trumpet-shaped thin-walled right pulmonary artery which enters the hilum of the right lung. There is no left pulmonary artery.

### SUMMARY

This case presents the following cardiac anomalies.

1. Incomplete double aortic arch (intermediate portion of the left arch being deficient.)
2. Dextroposition of the aorta.
3. Pulmonary atresia.
4. Ductus arteriosus, persisting as a small vessel communicating only with the hilum of the right lung by way of the right pulmonary artery.
5. Pulmonic circulation maintained by means of hypertrophied bronchials, branches of the left aortic root.
6. Incomplete ventricular septum, the endocardial cushions having failed to fuse.

The following observations of clinical interest may be made. Nature had attempted to compensate for the deficient aeration of the blood. The red cells were 200 per cent; hæmoglobin 100 per cent; therefore the blood had the normal carrying capacity for oxygen and one wonders whether the increase in red cells was a compensatory arrangement.

The blood pressure of the pulmonic circulation could have been little, if any, below that of the systemic.

## II. DETAILED DESCRIPTION OF HEART AND AORTA

(MAUDE E. ABBOTT)

### *Heart*

The heart is a heavy muscular organ with a broad ventricular part measuring 12 cm. across at its base, and 10 cm. in length, with rounded slightly bifid apex, composed about equally of both ventricles. From about the middle of its base arises the greatly dilated and thick-walled aorta between the much enlarged right auricle and smaller left auricle, both of which are visible anteriorly. At first sight no other vessel is seen, but examination reveals a small thin-walled pulmonary artery, 2 cm. long and 1 cm. wide, which emerges from the musculature just in front of the root of the aorta and passes obliquely up and to the left, dividing into two small branches. It is thus patent in its distal portion but is completely closed at its origin from the heart just below the valve, which is represented by a tiny rudimentary fold of fibrous tissue separating two minute sinuses.

The heart has been laid open from behind by incisions through auricle and ventricle, leaving the intact interventricular septum exposed. This is a massive muscular structure, nearly 2 cm. thick in its lower portion, and incomplete above, where it ends in a rounded muscular free border which forms the lower margin of a huge defect, 4 cm. long by 2 cm. wide, extending from just in front of the pars membranacea septi to the junction of the anterior and left posterior (right and left coronary) aortic cusps. The endocardium covering the free border of the defective septum is thickened and the septal cusp of the tricuspid valve takes origin in part from it. The dilated aorta, which is 9 cm. in circumference and very thick-walled, arises above the defect, 4 cm. of its lumen lying in the left, and 5 cm. in the right ventricle (*rechtslage* or dextroposition); it has three semilunar cusps, of which two, the right and left coronary, are very large, 3 cm. in length, screening roomy sinuses of Valsalva, toward the upper border of which lie the large and patulous right and left coronaries; the contiguous halves of these two cusps are extensively fenestrated and behind the anterior one in the depths of its sinus is a small calcareous nodule suggesting an obliterated raphe. The third aortic segment (right posterior or free cusp) is much smaller than the other two and has a peculiar interwoven structure; it is fused with the adjacent half of the anterior (right coronary) cusp and between the layers of the commissure so formed is a large hæmatoma, apparently the result of the impact of the current of blood entering from the right auricle and impinging at this point on its way into the aorta. Just anterior to this cusp in the depths of the angle formed between the anterior wall of the heart and the base of the defective interventricular septum is a short muscular partition 0.5 cm. long, which is the posterior wall of the rudimentary pulmonary conus, which admits a small probe and then ends blindly just below the obliterated pulmonary orifice.

The tricuspid valve lies posteriorly and to the

right of this rudimentary conus. Its septal cusp is of normal shape and structure, but arises in part from the posterior part of the upper border of the defective interventricular septum, and in part from the adjacent septum. Its marginal and infundibular cusps are partly merged with each other and the latter has many anomalous fenestrations; behind the attachment of the marginal cusp to the myocardium is a calcareous mass the size of a bean. The muscle of the right ventricle is enormously hypertrophied (1.5 to 2 cm. thick), but its cavity is only slightly enlarged (simple hypertrophy). The left ventricle on the other hand is very roomy, and its walls are also much thickened (1.5 cm.), though less than on the right side. The mitral valve is normal and the left auricle is of normal size, but the right auricle is greatly dilated with hypertrophied walls. The auricular septum is entire and the foramen ovale is completely closed.

*The Aortic Arch and Descending Thoracic Aorta*

The specimen consists of a right aortic arch and its branches with the trachea at its bifurcation and the right bronchus attached to a portion of the hilum of the right lung, and the œsophagus. The ascending arch has been cut off about 3 cm. above the heart and at this point the lumen is 3.5 cm. in diameter. It curves to the right instead of to the left, descending on the right side behind the right bronchus and gives off, in the following order, the left innominate, right carotid and right subclavian arteries, diminishing gently as it does so, so that just after the origin of the latter vessel it is 2.5 cm. in diameter. About 1.5 cm. below this point there emerges from the left posterior wall of the right aortic trunk a thin-walled tube about 0.75 cm. in diameter, which expands about 1 cm. from its origin in a bulbous fashion, and presents an orifice 1.2 cm. in diameter of a vessel which apparently entered it and which may have been the right branch of the atresic pulmonary artery. After this opening, the thin-walled vessel resumes its previous calibre and then dilates again, gradually expanding in trumpet fashion until after a course of 9 cm. it presents a flared-out end 3 cm. across, which has been cut off by the pathologist, who states that at this point it entered the hilum of the right lung and had no connection whatever with the left lung, apparently functioning as a right pulmonary artery. Internally, this cut end presents an atheromatous surface. At a point 2.5 cm. below the entrance of this curious structure the descending aorta gives off from its left wall a thick-walled trunk of about equal diameter to itself (2 cm.), which curves upward behind the right bronchus occupying the position of the primitive left dorsal aorta, and is undoubtedly a persistence of the proximal part of this structure (persistent left aortic root). About 1 cm. from its origin this anomalous left aortic trunk bifurcates into two branches; the superior, larger one, curves obliquely upward to the left giving off in its course four branches, one of which enters the hilum of the right lung anteriorly, and the other three (which are cut off) probably passed to the left lung, and served as bronchial arteries; the final distribution of this superior branch of the left aortic root is unknown, for it has been cut off about 4 cm. from its origin, but from its direction it probably supplied a part of the distribution of the left subclavian artery. The inferior and smaller branch of the left aortic root is about the size of a slate-pencil, passes into the hilum of the right lung behind the right bronchus; it undoubtedly functioned as a right bronchial artery. About 1.5 cm. below the left aortic root another anomalous vessel emerges from the left wall of the descending aorta, which probably also went to the left lung. The œsophagus lies behind and to the left of the aorta in its entire length. The trachea lies in front of the œsophagus and behind the transverse arch, but after its bifurcation the right bronchus passes outward to the right lung in front of the left aortic root, the upper branch of which emerges at the bifurcation of the trachea and passes upward and to the left *in front* of the left bronchus to its destination on the left side of the body.

REMARKS

This rare case is of special interest because of the remarkable adaptations which had facilitated the course of the blood and so permitted the patient to attain a relatively mature age, in the presence of a pulmonary atresia and suppression of the normal development of the left aortic arches, which were apparently the primary lesions. These adaptations are: IN THE HEART; (a) The incomplete development of the inter-

ventricular septum and the dextroposition of the aorta, which vessel received all the venous blood from the right chambers above the defective septum, as well as the arterial blood from the left side; (b) the enormous hypertrophy of the musculature of the right ventricle which propelled the blood from the right auricle, first into the stenosed pulmonary conus and then into the aorta, and the hypertrophy and dilatation of the left ventricle which assisted the right in pushing the blood through the aorta into the lungs. IN THE AORTA; (a) The large varicose trumpet-shaped tube which apparently represented the patent ductus and anomalous right pulmonary artery, and evidently carried the mixed venous and arterial blood from the heart to the right lung for aeration; (b) The rich arterial supply to both lungs from the persistent left aortic root apparently fulfilling the function of the bronchial arteries; (c) The anomalous vessel from the descending thoracic aorta, which from its direction probably furnished an additional path for blood to the left lung.

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## THE TREATMENT OF EPILEPSY*

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THIS paper will have to do, primarily, with the treatment of epilepsy as it is carried out at the Ontario Hospital, Woodstock, with special reference to the value of Phenobarbital (Luminal), in the larger dosage, in bringing about the arrest of seizures.

Provincial hospital treatment along modern lines appears to be the best means of handling the epileptic problem. The ideal arrangement would be to have all the epileptics of the province treated in one hospital. Accommodation should be provided for two main groups:—

1. The defective, demented, and the psychotic epileptics.
2. The sane epileptics.

The buildings for the two sexes are best kept widely separated on the same grounds, being divided by some natural barrier, such as a stream or body of water. Ample accommodation is necessary, to allow of segregation according to mentality and behaviour. The necessity of this is obvious to the most casual observer who visits the wards where such a provision does not obtain.

For purposes of treatment, all admissions would resolve themselves into one of two main groups, based mainly on prognosis: (1) those requiring protracted treatment and care; (2) those for temporary hospitalization.

The first group embraces those who are (a) epileptic, on a mentally defective basis; (b) demented, secondarily to chronic epilepsy; and (c) the epileptic psychotic patients, in whom the epilepsy *per se* forms a minor part of the whole picture. Even though their seizures were arrested they would be unable to earn a livelihood in a competitive labour market. Some, owing to asocial habits or abnormal behaviour reactions, cannot be cared for in the home. For this type of patient proper nourishment, regularity of rest, work and recreation with direct supervision under hygienic conditions, together with moderate medicinal treatment, would do wonders towards making them a happy, contented and useful people. This is in reality the colony system.

Under the second head comes that type of patient who is commonly called the "sane epileptic," who, if his seizures were arrested, could take his place in the economic world; and whose intelligence is of such an order that he would carry out, after he left the hospital, the routine

*Read at the Spring Meeting of the Ontario Neuropsychiatric Association, London, Ont., on June 11th, 1928.

treatment worked out to suit his particular case, or younger cases whose parents could be depended upon to see that it was carried out.

Pierce Clarke[1] characterises the epileptic constitution, as a "personality defect of egotism, morbid sensitiveness, hypochondriasis and poverty of ideas." Owing to this, he claims, the epileptic is incapable of social adaptation and is rendered inadequate to lead a normal adult life. He states this condition is present from earliest childhood and may be studied in a detailed psychological investigation of the life history antecedent to the onset of the fits. When present in an outstanding degree, its possessor may develop into a confirmed epileptic.

Turner,[2] in investigating a large number of young epileptics, finds good reason to doubt the existence of this mental "make-up." His results do not confirm what has been described as "the epileptic personality." He found that the absent-minded, the indifferent, and the day-dreamer formed only a small number of the cases. Those who are described as passionate and difficult to manage were about equal in number to those whose mentality was bright, intelligent, and often precocious. The self-satisfied, selfish, and self-opinionated formed quite a small group. On the other hand, the outstanding feature was that which may be described as nervous, anxious-minded and easily worried. These young persons were often highly emotional and were described by relatives as "neurotic" and sometimes hysterical. A small number were found to be reticent, studious and reserved. He says, "Such types, indeed, might be found amongst a similar number of young persons at any school." He states further, that the increasing knowledge of the psychology of epileptics convinces him of the great part played by anxiety, apprehension and fear in the development of their mental outlook. The uncertainty as to when or where a fit may come on breeds anxiety and apprehension. Some seizures, more especially those of the "petit mal" variety, are accompanied by an intense sense of fear which may even actuate the patient's conduct after an attack. There are so many features of the disease of an alarming kind, that, as it progresses, an increasing degree of anxiety fills the mind of the patient and determines his behaviour.

As Turner[2] states, "all writers on epilepsy are agreed as to the mental enfeeblement, sometimes amounting to dementia, which may develop in the chronic epileptic and there is a general consensus of opinion that this mental crippling results from the repetition of seizures over a long period of time. Further, I would submit that the acquired nature of the epileptic mentality in many cases receives confirmation, if or when an opportunity is offered of observing an arrest of seizures even after the disease has lasted for many years. In a few striking cases of arrest of fits by the aid of luminal therapy, after years of illness, I was able to observe the passing away of the anxieties and difficulties of the epileptics' existence, the re-establishment of self-confidence and a return to a more normal social life."

Rows[3] also in a recent work on epilepsy, is substantially in agreement with Turner.

Gowers[4] in discussing the essential element in the disease states that "as a disease, it consists in the repetition of attacks, which depends on the fact that every functional state of the brain, normal or abnormal, leaves behind it a condition in which the same functional state occurs with greater readiness. The effect is the greater the more often the functional action has occurred. The tendency to the recurrence of attacks of epilepsy of every form is increased by each one. Every fit, slight or severe, is in some degree the effect of those that have preceded it, the cause of those that follow it. This residual disposition to repetition of the same activity is the physical basis of memory, of muscular training, of all cerebral education, and it is the basis of the morbid education of the brain which underlies epilepsy. The recognition of this is essential for an adequate comprehension of the causation of epilepsy, and also for the principles of its successful treatment."

If the views of Turner, Rows and Gowers are correct, and I am convinced that they are, from personal observation and study of quite a large number of cases, then the logical course of procedure, after the diagnosis of epilepsy has been made, would be to begin the arresting treatment at once in an environment and under conditions best suited to bring about the desired results promptly and completely. I submit that such environment and conditions would be found in a hospital for epileptics as outlined above. Then, when an arrest has been established over a convincing period of, say, from one to two years, the patient should go home on probation to continue the treatment under the supervision of the family physician and subsequently be discharged from hospital.

The view has been advanced that, owing to the

predisposing influence of heredity in quite a large percentage of cases of epilepsy, epileptics should not be allowed their freedom, as they may marry and propagate their kind. Turner,[2] finds a family predisposition to epilepsy in approximately 33 per cent of all cases, both private and hospital. Brain[5] found a family history of epilepsy in 28 per cent of 200 hospital cases. Gowers[4] among 1,182 cases, in both private and hospital practice, found a percentage of 46. The records of Woodstock show an admitted neuropathic background in about 25 per cent of more than 800 cases. The percentages, naturally, vary according to the means of investigation.

There is by no means agreement among writers that heredity plays a large or even minor part in the causation of epilepsy, and there would be great difficulty in securing agreement amongst the leading neurologists and psychiatrists that all epileptics should be sterilized. Certainly, public opinion is not yet ready for such a sweeping measure, nor yet ready to have all epileptics confined to institutions, even if facilities were at hand. The only course open would be to allow the selected cases, as soon as an arrest by treatment has become established, as outlined above, to return home to lead again a normal existence.

It is difficult, beyond question, to secure the proper co-operation of the patient or parents when the patient is treated at home or in out-patient clinics. It is necessary to get him away from the harmful indulgence of parents, who feel that, because he is ill, he must be humoured in everything. One is never sure that the treatment is being carefully carried out. Nor is one sure that during that experimental period, when a suitable treatment is being sought for or the proper dosage determined, when the seizures are "breaking through" that he can "hold" his patient. The patient or parent becomes discouraged and goes the rounds of irregular practitioners, quacks and faith-healers with the inevitable result, a great loss of ill-spared time and often of money. Then, too, there is the effect on the mentality of the patient in having to be kept away from the amusements and places where others congregate. He eventually feels that he is abnormal and becomes asocial.

The hospital at Woodstock was originally intended to take care of just such a problem of treatment and care of the sane epileptic. The mentally defective epileptics and those showing marked mental changes were to be admitted to the mental hospitals. Owing to the congestion at the mental hospitals, and to the persistent demands of physicians in all parts of the province that consideration be shown to their applicants, whose families were unable longer to care for them, a number of defective and psychotic epileptics have been admitted to Woodstock. Then, too, a number of patients in residence, whose progress was retrograde, finally became demented. Therefore, it was found impossible to maintain the standard set. Yet, in spite of the limited accommodation available for the sane epileptic, much has been accomplished, which has justified the attempt made to treat this type of case in hospital, and should point the way for further developments in this sphere of therapeutics.

When a patient is admitted to the hospital at Woodstock, a detailed history is obtained, special attention being paid to that part of his life prior to the onset of the first seizure and to the aura, if any. A thorough physical examination covering in particular the fields of eye, ear, nose and throat, to determine if remedial surgical intervention is indicated.

X-ray examination of the skull and gastro-intestinal tract is particularly desirable. A routine laboratory examination is carried out, including urinalysis, blood Wassermann, and blood chemistry. These examinations are repeated from time to time, after the patient is put on treatment, and comparisons made with previous findings.

General surgical measures such as castration, ovariectomy, thyroidectomy, ligature of the vertebral arteries, excision of the cervical sympathetic trunks, are unjustifiable to say the least. It is to be particularly remembered in this connection that any operation may be temporarily followed by a cessation of seizures. This is also seen after acute illnesses, after a severe injury, and during pregnancy; the fits may remain in abeyance for many months.

The greatest success attends operative procedure in which a direct attack is made upon the probable source from which the irritating stimuli emanate, in traumatic cases, intracranial cysts and non-infiltrating new growths. Ophthalmoscopic examination is important in picking out these latter types. The surgeon's aid is indicated in cases of aural or nasal polypi, phimosis, herniae, painful cicatrices, etc.

The greatest measure of success attends surgical intervention in the removal of causative

factors in so-called reflex epileptic types. Zabriskie[6] states, "it is fairly safe to say that whenever the diagnostic criteria of production of a fit by stimulation of the irritative focus, etc., are satisfied, removal of the focus will cure the epilepsy." In accepting his statement one should take into consideration cases of long standing that may have acquired the epileptic habit of spontaneous discharge, in which this would not obtain.

A cold shower on rising, followed by a brisk rubdown, is to be particularly recommended for epileptic patients of the more or less rugged type. Full co-operation of the patient is desirable here, and time is well spent in securing such co-operation. He enters into it with much more zest and enthusiasm, if he feels he is doing so of his own free will and accord, rather than under compulsion. Once he commences, he understands it is to be routine. No fads are indulged in. He is made to feel that when he leaves Woodstock he can carry his healthful practices over into his life outside. The training he gets in the care of himself and others is comparable to that secured in sanitaria for the treatment of tuberculosis in the early stages. He is made to feel the importance of general health measures, regularity of habits, and the strict adherence to therapeutic measures laid down for him.

The diet is simple, readily digestible and anticonstipating. Bran is incorporated in the morning meal. The principal meal is at midday. Animal protein, in replacement amounts, is given in some form at this meal, together with abundance of fresh vegetables in season. Here again the food is not widely different to that in his own home. The ketogenic dietetic treatment of epilepsy runs foul of this principle, and one that there is difficulty in having the patient consistently follow after he leaves the hospital. This is an important point in dealing with the group under consideration.

An outline of this form of treatment may be given at this point. Periods of starvation have been employed in the treatment of epilepsy, being based on the observation, that, during fasting and acute febrile illnesses, the seizures were markedly lessened. In the chemical study of patients so treated, the most striking changes found were a lowered blood sugar, a ketosis-acidosis, and a slight lowering of the carbon-dioxide combining power of the blood.

Wilder,[7] and later Peterman,[8] produced these same chemical changes by developing a so-called "ketogenic diet." By keeping the carbohydrates and protein low and the fat content in the diet high, insufficient glucose is available for complete oxidation of the fat into its normal end-products, carbon dioxide and water. This incomplete combustion results in the liberation of intermediate products, the ketone bodies, chiefly aceto-acetic acid, which break up into acetone and beta-oxybutyric acid, present in the blood in the form of salts, and are excreted in the breath and urine. This is the condition of ketosis-acidosis.

The carbohydrates, fats and proteins are classified as ketogenic and antiketogenic substances: the former are substances producing aceto-acetic acid in the absence of glucose bodies; the latter are substances producing glucose bodies which prevent the formation of ketone bodies. The values are as follows:—

| | *Ketogenic* | *Antiketogenic* |
|---|---|---|
| Carbohydrates..... | 0% | 100% |
| Fats..... | 86% (Approx.) | 14% (Approx.) |
| Protein..... | 33% (Approx.) | 66% (Approx.) |

Talbot,[9] in working out diets, regards fat as 100 per cent ketogenic, carbohydrates 100 per cent antiketogenic, and protein half and half. According to these values, a proportion of ketogenic to antiketogenic foods in the usual diet is about 1 to 4. If the relationship of the ketogenic to the antiketogenic foods is 1.5 to 1, ketosis does not develop. "A 1.5 to 1 ratio means that the diet contains 1.5 grams of fat for each gram of carbohydrates and protein (combined)." "The protein allowance for any patient is one gram for each kilogram of the patient's expected body weight. The total caloric needs are 50 per cent above the basal requirements (Talbot[10])." "With an increase of this ratio to 2 to 1 or more, a ketosis develops, and the higher the ratio the greater is the ketosis. Coincidentally with the marked ketonuria resulting from the diets of a higher ketogenic ratio, a reduction or cessation of attacks has occurred (Talbot, Metcalf and Moriarty[11])."

The changes in the diet are made slowly at about one to two week intervals. A 4 to 1 ratio is generally required before the symptoms completely disappear. This usually takes a period of two months. The patient is kept on the diet until he is free from seizures for six months. The diet is then gradually relaxed by increasing the carbohydrates 10 grams at a time, and reducing the fat in the corresponding amounts, maintaining the same value in caloric intake (Talbot[9]).

These changes are continued until the child is on a normal diet with a limited amount of carbohydrates. It is necessary always to exclude candy and other sweets from the final diet. Luther[12] states, "it is too early as yet to reach definite conclusions as to the permanence of the relief." Talbot[9] reports complete symptomatic relief in at least 33 per cent of children, and definite improvement in nearly three-quarters. The results are accordingly good in "petit mal" and "grand mal," but less satisfactory in the adult than in the child. Excessive intake of sweets is followed by attacks. Talbot, Metcalf and Moriarty,[13] who are very enthusiastic over this method of treatment, state, "The difficulties of the diet in epilepsy are the same as those experienced in the treatment of diabetes mellitus before the advent of insulin; good and bad results depending in large part upon how strictly and accurately the diet is followed. In both instances indiscretions in carbohydrates are usually followed by relapses."

The *modus operandi* of ketosis-acidosis in bringing about the clinical improvement is still a matter of conjecture. The view that the freedom from attacks is due mainly to the hypoglycemia produced is not substantiated by Talbot, Metcalf and Moriarty,[13] in a three months' study of insulin therapy in conjunction with an ordinary diet. That the anæsthetic action of acetone may be the cause of the improvement is admitted by Talbot.[9] If the arrest of seizures is brought about by the anæsthetic action of acetone, the patient producing his own drug by a method of diet admittedly difficult to maintain, one might well adhere to drug treatment, allowing the patient more or less freedom of action as to diet after he leaves hospital. A highly complicated diet is certainly not compatible with the facilities at hand for an adult taking his place in this work-a-day world. If the future proves that the ketogenic diet brings about a permanent arrest of the seizures, even though hospital treatment of one or two years is necessary, it would be worth while indeed.

The value of the salts of bromine has long been recognized in the treatment of this disease. Turner[15] regards large doses of bromides as neither necessary nor effectual. Both the amount of the dose, frequency and time of administration, must be gauged by a study of individual cases. He does not look with favour on prescribing fifteen grain doses three times daily. The night dose is to be preferred.

The three common bromine salts of potassium, sodium and ammonium are those most commonly used. The potassium and sodium salts are the most efficacious according to Turner,[15] and may be prescribed alone or in combination. The dosage of the combined salts must not exceed 45 to 60 grains in the 24 hours.

Gowers[4] introduced sodium biborate in the treatment of epilepsy in certain cases where the bromides were of little value. This has been used at Woodstock in combination with strontium bromide, with favourable results.

The main disadvantages associated with the use of bromides are the skin eruptions, and a dulling or blunting of the faculties. This has been our experience especially in pushing the drug to sufficient dosage to bring about the complete arrest of seizures. The results obtained from the use of luminal have been comparatively so outstanding that at the present we use bromides only to a small extent. We have found bromides useful in moderate doses in a few cases where luminal, in sufficient dosage to control the seizures, was not well borne. We were not able to bring about an arrest of seizures in these cases however.

On this continent luminal enjoys an increasing popularity in the treatment of epilepsy, since its introduction from Germany, more than fifteen years ago, as an antispasmodic and sedative. It is a hypnotic in large doses. The threshold of hypnosis varies markedly in individual cases of epilepsy, and, in our experience at the Ontario Hospital, is much higher than in non-epileptics.

Dercum,[16] in one of the earliest reports of an extensive use of the drug in epilepsy, found it exercised a remarkable control over the seizures. He limited the dosage to a maximum of 3 grains per day. No deleterious influence upon the mental life of the patient was observed. Again in 1922, he reported[17] that "in the ordinary so called 'essential' form of epilepsy no remedy has proved of so much value as luminal." He limited the dosage to 1 to 1½ grains daily, given in one dose at bedtime. A great improvement was noticed in the general health of the patients so treated.

Cobb[18] believes that luminal is a very useful drug in the treatment of epilepsy. He considers it unsafe to give more than 1½ grain doses, which should not be repeated more than once in the twenty-four hours.

Patterson, Daman and Levi,[19] of Sonyea, in reporting the results of luminal therapy in a

group of 300 cases, in which the drug was given *per os* in 1½ to 3 grain doses, state that no greater benefit was noted in several cases in which the dose was doubled and in some instances even tripled. They depended upon its cumulative effects over long periods of time to bring about the arrest of seizures.

Johnson,[20] of Liverpool, limits the dosage of luminal to 2 grains, t.i.d. (as a maximum).

Grinker,[21] with his extensive clinical experience with luminal in epilepsy since the end of 1913, advises against the indiscriminate use of luminal, but states, "one should begin with average doses of from 1½ to 2 grains (0.1 to 0.13 grm.) of phenobarbital daily and 'feel' his way up or down the scale until results are obtained." He states that "Phenobarbital, when taken over many years, neither causes damage to the viscera nor results in habit formation." All writers are apparently agreed that the attacks recur when the drug is withdrawn, and if this is done abruptly there is a danger of status.

At Woodstock, luminal had been given in more or less small dosage for some years, in keeping with the methods recommended by numerous writers quoted above. A degree of success attended its use. At the beginning of the year, 1925, there were 92 patients on luminal therapy. Sodium biborate and strontium bromide were used in combination with luminal in some cases.

The findings on August 1st, 1925, were as tabulated below according to dosage.

TABLE I

| | *Group I.*<br>*79 Cases*<br>*Lum. grs. 1½*<br>*q.h.s.* | *Group II.*<br>*13 Cases*<br>*Lum. grs. 3*<br>*q.h.s.* | *Group III.*<br>*1 Case*<br>*Lum. grs. 3*<br>*b.i.d.* | *Per Cent* |
|---|---|---|---|---|
| Arrests..... | 1 | 1 | 1 | 3.3 |
| Improved.. | 12 | 3 | | 16.3 |
| Unimproved | 66 | 8 | | 80.4 |

It must be remembered that in these groups are included a large number of confirmed and intractable cases. Only 33 were without mental defect or deterioration. These figures have to do with luminal therapy, and, of course, do not include the number of arrests brought about by other means.

In Group III., the only case which was given a fairly high dose of luminal with no other medication, other than laxatives as required, showed a convincing arrest of seizures and no by-effects. Encouraged by this improvement, it was decided to try out increased dosage over the whole group and to continue increasing the dosage gradually in those cases which warranted it, *i.e.*, by improvement and absence of by-effects.

On August 24, 1925, the scheme of treatment by increasing doses of luminal was commenced. Improvement was soon apparent and we were encouraged to go on. A survey of results was made every three to six months and treatment readjusted accordingly.

Of the original group of 92 patients on luminal in January, 1925, by August 24, 1925, 7 had been discharged. Treatment was followed up in the remaining 85 cases. The last schedule but one of treatment went into effect on October 12, 1927. On this dosage the following tabulated results are based:—(*See table II*)

Of the 85 patients, 34 belong to what we are terming the sane group. An arrest of seizures was established in 22 cases, or in 60.4 per cent.

Besides the original group, other confirmed and intractable cases were put on luminal, as well as the new admissions, making a total on April 11th, of this year, of 205 cases since the commencement of treatment on August 24, 1925. The results of treatment in this large group, in which only those in the end stages of epilepsy were excluded, are as follows:—(*see table III*)

TABLE II

| | *Group I.*<br>*5 Cases*<br>*Lum. grs. 1½* | *Group II.*<br>*43 Cases*<br>*Lum. grs. 3* | *Group III.*<br>*14 Cases*<br>*Lum. grs. 4½* | *Group IV.*<br>*22 Cases*<br>*Lum. grs. 6* | *Group V.*<br>*1 Case*<br>*Lum. grs. 7½* | *Total 85* | *Per Cent* |
|---|---|---|---|---|---|---|---|
| Arrests..... | 1 | 12 | 3 | 12 | 1 | 29 | 34.1 |
| Improved..... | 2 | 11 | 2 | 4 | | 19 | 22.4 |
| Unimproved..... | 2 | 20 | 9 | 6 | | 37 | 43.5 |

TABLE III

| | *Group I.*<br>*31 Cases*<br>*Lum. grs. 1½* | *Group II.*<br>*101 Cases*<br>*Lum. grs. 3* | *Group III.*<br>*32 Cases*<br>*Lum. grs. 4½* | *Group IV.*<br>*36 Cases*<br>*Lum. grs. 6* | *Group V.*<br>*4 Cases*<br>*Lum. grs. 7½* | *1 Case*<br>*Lum. grs. 9* | *Total 205* | *Per Cent* |
|---|---|---|---|---|---|---|---|---|
| Arrests of 4 months to 2 years..... | 6 | 20 | 11 | 15 | 2 | 0 | 54 | 26.4 |
| Improved.... | 5 | 24 | 7 | 8 | 2 | 1 | 47 | 22.9 |
| Unimproved.. | 19 | 57 | 14 | 14 | 0 | 0 | 104 | 50.7 |

In the whole group of 205 cases, 79 are classed as sane. The seizures were arrested in 43, or 54.6 per cent. Those who died while on treatment are included in the "unimproved," even though they had shown some improvement over a considerable period before death, and others on small dosage who were discharged as unimproved. A number of psychotic patients, who later refused treatment, are also included in the unimproved class. Therefore the percentages are actually higher than the above.

On April 11, 1928, the last treatment schedule went into effect. The dosage was raised in a number of the intermediate groups and further encouraging results are apparent. Nineteen more complete arrests have become established so far; 9 show all but arrest. It is too early at present to include these in our percentage data, but it shows that the end of improvement is not yet.

In this treatment schedule, 5 patients (3 male and 2 female) were given grains 9 of luminal daily in divided doses; grains 3 at breakfast; grains 1½ at dinner; and grains 4½ at the evening meal. The two young women and three young men state they never felt better in their lives. When they first began this higher dosage they complained of a certain drowsiness during the day but as they were working every day this soon wore off. These patients will take grains 4½ of luminal at 5 to 6 p.m., then go to the patients' weekly dance and dance for two hours steadily, and seem disappointed when bedtime arrives. There are no signs or symptoms of kidney irritation in these cases. Urinalyses are done frequently. In testing for acetone, a false positive reaction in the sodium nitroprusside test was evident in three of the five cases and in many other cases on moderate dosage. This is not coincident with the arrest of seizures, while others showing no reaction at all evidenced marked clinical improvement or arrest.

It is only the occasional case that can stand this high dosage without marked by-and after-effects, such as a persistent half-dreamy state on waking in the morning, often accompanied by incontinence of urine, drowsiness during the day, vertigo, double vision and a markedly ataxic gait. Caffeine in 1 grain doses in combination with the morning and noon dose of luminal is of considerable benefit in drowsiness. This symptom, if present in a very mild degree, will wear away in a few days in many cases, especially if the patient is naturally active and alert. Treatment cannot be pushed if the patient indulges his lazy propensities, or if cerebration is retarded. Any degree of the other by- or after-effects is an indication for reduction of dosage. Cutaneous eruptions have been conspicuous by their absence in our experience. The dose that will bring about a marked reduction or cessation of attacks is seldom accompanied by any untoward signs or symptoms in the alert, intelligent patient. This cannot be said of the epileptic of low mental status or in cases of retarded cerebration. Occasionally a few of these cases are made more irritable by the drug and can best be treated with moderate doses of bromide.

In comparing the effects of luminal, little difference was noticed between idiopathic cases and those with an apparent organic basis. Grand-mal is more amenable to luminal therapy than is petit-mal. This is especially noticeable in the combined petit- and grand-mal types. While a small dose would arrest the grand-mal, it took a considerably higher dosage to bring about the arrest of the petit-mal attacks. Our results do not bear out the observations of Patterson, Damon and Levi,[19] that a patient who is subject to the grand-mal type of seizures only, under luminal therapy would have merely petit-mal attacks. The types are so often combined that a mild degree of petit-mal could be overshadowed by the grand-mal attacks.

In rare cases luminal appears to act as a convulsive agent. This type is usually the one in which consciousness is not entirely lost. The convulsion is not complete. There is no great amount of either tonic or clonic spasm. The patient threshes about a great deal, and is apt to do considerable damage to clothing and furniture, but seldom does himself the harm that one expects. I would be tempted to classify this as hysteria, were it not for the fact that I have seen definite petit-mal attacks in these same individuals. Tincture of belladonna (B.W.) and tincture of hyocyamus (B.W.), in heroic doses of 22 minims and 1 drachm, respectively, three times daily after meals, used in conjunction with luminal of fairly high dosage, work wonders in some cases, and where luminal or the mixture, when used alone, produces other than beneficial results. The mixture is also of benefit in a case where the general nerve tone is low, the patient being weak, listless, salivating freely, and having many seizures. Luminal depresses such a patient still further, whereas the above mixture in the large doses lessens the frequency of the seizures only to a small extent,

but the change in general is remarkable. Salivation stops, cerebration is quickened, the physical strength returns, and the patient appears to be practically normal.

The method of administration of luminal at Woodstock is by the oral route. The dosage is divided according to whether the seizures are nocturnal or diurnal. In the majority of cases luminal is best tolerated given in the morning and evening. In some cases, where the morning dose of 3 grains was divided and given in the morning and at noon, the patient complained of drowsiness. This was not apparent when he received the full dose in the morning, as well as his evening dose. The luminal tablets are given at breakfast, in some cases at noon, and at the evening meal at 5 to 6 o'clock. This early administration of the evening dose does away in many cases with drowsiness the following morning.

Paterson, Damon and Levi,[19] in investigating the other methods of administration of luminal in the form of its sodium salt, *viz.*, subcutaneous, intravenous, and intraspinous, found that the intravenous method was the most rapid in bringing about therapeutic effects and was the method of choice in status epilepticus. At Woodstock, at present, in these cases we rely on chloroform anæsthesia to the surgical stage, together with double doses of H. M. C. No. 1 to continue its effects, or a chloral enema (grains 30-60). The results have been very satisfactory.

We are in agreement with Paterson, Daman and Levi,[19] who state that, as luminal is a palliative measure, it must not supplant attention to general hygienic measures, to improvement of the patient's general condition, the inculcation of regular habits, and medicinal treatments as indicated.

Constipation is the rule rather than the exception in our new cases. Obviously, this condition must be remedied before the best results are obtainable from luminal therapy. On admission to the wards the patient, if constipated, is given a large simple soap enema, and oleum ricini (oz. 1½) at bed time. This is followed every night by Russian oil in sufficient quantities, together with magnesium sulphate once weekly. We do not put him on luminal, however, until he "registers," that is to say, he is allowed to have a few seizures for record and purposes of comparison.

In female patients changes in menstrual activity must be closely watched. Amenorrhea must be immediately treated by general and specific medicinal means, as seizures are very apt to recur during disturbances of menstrual function.

Many writers point out the beneficial effects of luminal therapy on the general behaviour reactions of epileptics. The patients so treated become more congenial, energetic and co-operative. This is especially true in cases of arrest in the sane epileptic. The very fact that his hopes are realized, and this type of patient is nearly always very hopeful, makes a marked difference in him generally. Introspection becomes less marked as his anxieties disappear. Self-confi-

TABLE IV

| | *Jan.* | *Feb.* | *Mar.* | *Apr.* | *May* | *June* | *July* | *Aug.* | *Sept.* | *Oct.* | *Nov.* | *Dec.* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1917.... | | | | | | | | 0 | 1 | 5 | 2 | 2 |
| 1918.... | 1 | 3 | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 2 | 1 |
| 1919.... | 5 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 6 | 0 | 2 |
| 1920.... | 2 | 0 | 1 | 2 | 1 | 0 | 3 | 1 | 1 | 1 | 1 | 1 |
| 1921.... | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 1 | 2 | 0 | 1 |
| 1922.... | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 3 | 0 | 1 | 0 | 4 |
| 1923.... | 0 | 0 | 2 | 1 | 1 | 1 | 0 | 0 | 6 | 0 | 2 | 2 |
| 1924.... | 4 | 1 | 1 | 0 | 1 | 1 | 3 | 1 | 2 | 1 | 2 | 0 |
| 1925.... | 0 | 1 | 1 | 0 | 2 | 3 | 0 | 0<br>L. i½ | 1 | 1 | 0 | 2 |
| 1926.... | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1927.... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1928.... | 0 | 0 | 0 | 0 | 0 | | | | | | | |

Treatment—August 24, 1925; Luminal grs. 1½, q.h.s.

dence is gradually re-established, and finally, after a year or so of freedom from attacks, he wants to again go out into the world to earn a livelihood. The difficulty in most cases is to curb this natural tendency long enough to make certain of the arrest.

When the arrest is convincingly established the patient's family physician is given an outline of the treatment and care necessary for the continued arrest of the seizures. We ask to be consulted before any change in treatment, such as the gradual reduction in the dosage of luminal. The patient is also given a detailed outline of treatment, diet, and hygienic measures. He is then allowed out on probation, reporting his progress once a month until discharged, then once every six months. This has been a very useful method in following up results. Co-operation in this regard has been particularly satisfactory.

The following charts and case reports typify the results in our experience in the treatment of epilepsy at Woodstock.

CASE 1

(Reg. No. 530), A.C., female, aged 52; admitted August 9, 1917.

Hereditary taint: nil. Fits at teething period: nil. Normal child. Injury at 10 years (kicked on the back of the head by a horse). Onset: at 13 years; puberty. On admission: grand-mal attacks about once monthly; mentality good. Treatment: Luminal, grains 1½, begun August 24th, 1925. Result: Seizures arrested since March 25, 1926; mentality normal; no by-effects; about to be discharged. (*See table IV*)

CASE 6

(Reg. No. 802), E. R., male, aged 11; admitted December 29, 1924.

Hereditary taint: nil; father intemperate. Fits at teething: slight. Injury: Acute poliomyelitis at 4 months, ill a month; badly scalded at 7 years, excessive scarring. Onset: at 8 years, while going to school; grand-mal. On admission: Having fits nearly every day; spoilt child; dull and below normal mentally. Treatment: Attended out-patient clinics at Montreal and Toronto. Was on small doses of luminal at that time. Treatment as below. Results: No apparent result from luminal in small doses; increased dosage brought about arrest; no by- or after-effects; mentality cleared; normal boy, played an excellent game of ball. Is now discharged on treatment and is going to school; good progress reports. (*See table V*)

TABLE V

| | *Jan.* | *Feb.* | *Mar.* | *Apr.* | *May* | *June* | *July* | *Aug.* | *Sept.* | *Oct.* | *Nov.* | *Dec.* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1924.... | | | | | | | | | | | | 1 |
| 1925.... | 15<br>L. i½ | 15 | 15 | 14 | 20 | 14 | 19 | 20<br>L. iii + ℞ | 3 | 10<br>L. iv½ + ℞ | 0<br>L. vi – ℞ | 0 |
| 1926.... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1927.... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1928.... | 0 | 0 | 0 | 0 | 0 | | | | | | | |

*Treatment.*—January 6, 1925, Luminal grs. 1½, q.h.s.; August 24, 1925, Luminal grs. 3, q.h.s., and Soda Biborate and Strontium Bromide t.i.d.; October 15, 1925, Luminal grs. 3, q.h.s., and grs. 1½, q.a.m., and Rx.; November 1, 1925, Luminal grs. 3 b.i.d., Rx. discontinued.

TABLE VI

| | *Jan.* | *Feb.* | *Mar.* | *Apr.* | *May* | *June* | *July* | *Aug.* | *Sept.* | *Oct.* | *Nov.* | *Dec.* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1922.... | | | | | | | 0<br>L. i½ | 3 | 2 | 3 | 3 | 3 |
| 1923.... | 2 | 2 | 2 | 2 | 5 | 4 | 1 | 4 | 4 | 4 | 4 | 2 |
| 1924.... | 3 | 2<br>L. + ℞ | 3 | 3 | 4 | 4 | 1 | 3<br>L. iii + ℞ | 2 | 3<br>– ℞ | 4 | 2 |
| 1925.... | 3 | 2 | 2 | 5 | 3 | 5 | 3 | 5 | 3 | 2 | 0 | 1 |
| 1926.... | 7 | 3 | 4<br>L. iv½ | 0 | 0 | 0<br>L. vi | 0 | 0 | 0 | 0 | 0 | 0 |
| 1927.... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1928.... | 0 | 0 | 0 | 0 | 0 | | | | | | | |

*Treatment.*—On admission, Luminal grs. 1½, q.h.s., and bran and laxatives; February 6, 1924, Luminal and Soda Biborate and Strontium Bromide; August 24, 1925, Luminal grs. 3, and Soda Biborate and Strontium Bromide; October 1, 1925, Discontinued Soda Biborate mixture; March 24, 1926, luminal grs. 3, q.h.s., grs. 1½, q.a.m., and yeast; May 10, 1926, Luminal grs. 3, b.i.d.

CASE 7

(Reg. No. 729), C. M., male, aged 29; admitted July 17, 1922.

Hereditary taint: nil. Fits at teething: nil. Injury: Struck on nose (at 17 years) by broken end of golf club; nose broken; unconscious for a short period. Onset: at 18 years, during college course; had one seizure, then was free for 14 months; then attacks every 6-8 days; grand-mal; no aura. On admission: mentality fair; rather dull; was on bromides; seizures, 2-3 per month. Treatment: As below. Complained of mental sluggishness when put on bromide in small doses. Luminal was finally used alone, with anti-constipation measures; cold shower on rising. May 10, 1926, increased margin of safety. Results: No by- or after-effects; mentality returned to normal; good general health. Built his own radio set while in hospital. Discharged June, 1927; excellent progress reports; free of seizures; working outdoors. (*See Table VI.*

## CONCLUSIONS

1. A confirmed arrest of epileptic seizures can best be brought about by hospital treatment.

2. More arrests of seizures are established by continued luminal therapy in moderate doses (3 to 6 grains daily, [0.2 to 0.4 gram]) than by smaller doses (¾ to 1½ grains daily, [0.05 to 0.1 gram]).

3. The by- or after-effects are but little more often encountered under the use of luminal in moderate doses than under small doses.

4. The dose of luminal in the treatment of the epilepsies is limited only by the dosage that can be reached without producing by- or after-effects.

5. The "grand-mal" attacks are more amenable to luminal therapy than the "petit-mal."

6. The cessation of attacks checks the mental deterioration associated with continued attacks.

7. Though luminal therapy in small doses is occasionally accompanied by an increase of epileptic attacks, larger dosage often results in an arrest in these cases.

8. In the sane epileptic, if the seizures are arrested for a considerable period of time, he is again fit to lead a more or less normal existence.

9. As luminal therapy is a palliative rather than a curative measure, it should not supplant attention to general hygienic measures, to improvement in the patient's general physical health, regular habits and other medicinal treatments as indicated, in the endeavour to bring about permanent arrest of the attacks.

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**Myotonia from Calcium Deficiency.**—Charles E. Kiely reports the case of a man, aged 26, who complained chiefly of pain in the small of the back and stiffness of the calf muscles. The significant history was that in 1921 while playing basket-ball he had been struck in the small of the back by another player's knee, and since had suffered from pain in that region. In November of the same year his shin bones became sore and jumping was particularly painful. In the fall of 1922, spasm of the calf muscles began. This appeared not with the imitation of movement but after severe effort. Other leg muscles became involved, but there has been no involvement of the trunk or arms at any time. Only rest and massage would relieve the spasm. There was no history of any muscular disease in three generations of his family, to his best knowledge. He had had no thyroidectomy or other likely source of injury to the parathyroid. There was no history of spasmophilia in childhood. He was obliged to discontinue athletics and dancing. His work involved climbing two hundred steps in one case and this became almost impossible. May, 19, 1927, the blood calcium report was 8.5 mg. per hundred cubic centimetres. Blood uric acid, urea, dextrose and creatinine were all within normal limits. Electrical reaction showed a polar reversal over the tibial nerve at a single examination, but was normal the next day before the beginning of treatment. The contraction to the electric current was rather slower than usual but in no sense tetanic. No attempt was made to induce a wave of mystonia by passing a current from one extremity of the body to the other, as too painful a current is required. The patient was given calcium lactate, 0.325 gm., three time a day. He reported prompt improvement. Electrical reactions were normal. November 14, 1927, he returned complaining of moderate exacerbation of stiffness. He had been taking calcium lactate only twice daily for several weeks. The blood calcium was 13.35. He was advised to increase his calcium to the original dose and did so, reporting January 25, 1928, that he was entirely relieved.—*J. Am. M. Ass.*, August 11, 1928.

# SOME COMMON MISTAKES IN THE DIAGNOSIS AND THERAPY OF DISEASES OF CHILDREN*

BY ALAN BROWN, M.B.,

*Toronto*

"IT is written that there 'abideth faith, hope charity, these three, but the greatest of these is charity.' And so in medicine we have diagnosis, which is a matter of faith; prognosis, which is a question of hope; and treatment, which is only too often an affair of charity: but the greatest of these is diagnosis. For, without accurate diagnosis, it is impossible to forecast the course and outcome of a disease or to treat it satisfactorily. Indeed, as someone has truly said, 'the first part of treatment is diagnosis, and the second, diagnosis, and the third, diagnosis.' I need make no apology therefore, for directing your attention to some reflections on such an important subject on this occasion." (Hutchison, R., *Brit. M. J.*, 1928, i, 335).

A review of the records of our hospital reveals the fact that certain diseases are very frequently overlooked by the physician in charge of the patient before his admission to the hospital. In the succeeding paragraphs your attention will be directed to these conditions, and the essential points in their diagnosis and treatment will be considered briefly, beginning first with new-born infants.

## HÆMORRHAGIC DISEASE OF THE NEW-BORN

This disease is characterized by spontaneous hæmorrhage from one or more parts of the body, and is of unknown etiology.

The hæmorrhages occur most frequently from the gastro-intestinal tract, as evidenced by bloody stools or vomited blood. The blood may be tarry, dark brown, or bright red. The next most frequent site of bleeding is the umbilicus. In occasional cases the bleeding may be intracranial, or may occur from the nose, conjunctiva, or under the skin. The bleeding and clotting time is usually prolonged, though in some instances it may be normal. The most frequent time of onset is the third day of life. The condition occurs with decreasing frequency, until it is practically never encountered after the twelfth day. Hæmorrhages at this late date are usually the results of general sepsis or syphilis. The treatment consists in the immediate transfusion of 15 c.c. per pound of body weight of whole blood. The blood of ungrouped donors should not be used. If facilities are not available for transfusion the intramuscular injection of a total of 20 to 40 c.c. of ungrouped blood may be given at three or four different sites.

## CYANOSIS IN THE NEW-BORN

Cyanosis in the new-born may result from atelectasis, intracranial hæmorrhage, congenital defect of the heart, or enlarged thymus. Atelectasis, which is an incomplete expansion of the lungs, usually occurs in premature or debilitated infants. The cyanosis is intermittent. Examination of the lungs frequently discloses nothing abnormal, unless the atelectasis occurs in a portion of one lung over which area a diminished air entry can be distinguished. The treatment consists in stimulating the infant to cry vigorously at frequent intervals. Intracranial hæmorrhage usually results from the tearing of blood vessels in the falx or tentorium. In mild cases the only symptoms are slight drowsiness and refusal to nurse properly. In the more severe cases there may be convulsions, as well as interference with the pulse and respirations. The cyanosis is usually constant. The only treatment is repeated lumbar puncture to drain off the blood. Congenital heart defects can be recognized on routine examination of the heart. Cyanosis, if due to a heart defect, is constant. There is no specific treatment. Cyanosis due to an enlarged thymus is intermittent.

## ENLARGED THYMUS

This condition is due to a hypersecretion of an enlarged thymus gland. The most frequent symptoms of the condition are, sudden attacks of cyanosis, or pallor, breath-holding spells, convulsions, and slight difficulty in breathing similar to that produced by a mild degree of laryngeal obstruction. In new-born infants this difficulty

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in breathing may be so marked in the severe cases that the symptoms resemble asthma. Although retrosternal dullness may be detected at the level of the first and second intercostal spaces, a definite diagnosis can only be made by means of an x-ray plate. In infants with only slight enlargement the shadow will extend just past the lateral borders of the sternum, while in marked cases the shadow will extend many centimetres on each side of the mid-line. At the present time we do not know the exact variations in the size of the gland, but we do know that infants with only a slight enlargement have very mild symptoms if any. We have never seen a severe or fatal case without a marked enlargement of the gland. Care must be taken in the diagnosis of enlarged thymus, as at the present time there is a tendency to consider many unexplained symptoms as due to this disease. The treatment consists in repeated exposure to x-rays, and this, to the best of our knowledge, will absolutely cure the condition.

### INANITION FEVER

Inanition fever occurs in new-born infants, and is due to a lack of fluid intake at a period when the heat-regulating mechanism is unstable. The objective symptoms are, fever, excessive initial loss of weight, some loss of elasticity of the skin, dry mucous membranes, and frequently an odour of acetone on the breath. The condition usually occurs during the third, fourth or fifth day of life in those cases in which the breast milk supply has not yet been established. The treatment consists in a rectal irrigation of water, and the administration of a suitable artificial feeding, until a sufficient supply of breast milk is available. The temperature will drop in the course of a few hours. Care must be taken not to mistake an infective process for this condition.

### PYLORIC STENOSIS

Pyloric stenosis is a marked hypertrophy of the circular muscle fibres of the pylorus, which results in narrowing and sometimes almost complete obliteration of the lumen. The objective symptoms are, projectile vomiting, visible gastric peristalsis, constipation, diminished secretion of urine, and loss of weight. A tumour may be palpated in the right hypochondriac or epigastric regions. To accomplish this, considerable time and care are frequently required. Food or water should be offered to the infant during the procedure to produce relaxation of the abdominal muscles. About 75 per cent of our cases occurred in male infants. The first symptoms of the disease usually appear during the second, third or fourth week of life. Only 11 per cent of our patients vomited at birth, while the maximum age at onset was seventy days. The treatment consists in immediate operation. This is followed by a simple transfusion. Post-operative treatment consists in raising the foot of the bed until the patient recovers from the anæsthetic. The infant is then turned on the right side and the head raised. Half an ounce of breast milk should be offered four hours after the operation, and the amount increased by a quarter of an ounce every four hours until the caloric requirements are fulfilled.

### TETANY

Tetany is caused by a deficiency in the diet of the antirachitic substance, or vitamin D, which results in a reduction of the blood calcium. Convulsions are the predominant symptom. In certain cases they may occur as often as thirty or forty times a day. The next symptom, and one which is almost invariably overlooked, is a peculiar inspiratory crow produced when the child cries. Chvostek's sign, which is a contraction of the facial muscles elicited by tapping the side of the cheek, is almost invariably present in infants with tetany. It is due to a hyper-irritability of the facial muscles. This sign is of no significance in infants over two years of age. A characteristic position of the hand (carpopedal spasm) is present in a moderate percentage of cases. Sometimes this position of the hand may be produced by a constriction of the arm for one or two minutes, and when the spasm is produced in this manner it is called Trousseau's sign. The before-mentioned five symptoms of tetany, namely, convulsions, laryngospasm, Chvostek's sign, carpopedal spasm, and Trousseau's sign are all due to hyper-irritability of the neuro-muscular system.

The age incidence and seasonal incidence of tetany are singularly striking. Of the cases encountered in the hospital during the past five years 80 per cent occurred at the fifth, sixth, seventh, eighth and ninth months of age; and 85 per cent occurred in the months of January to May inclusive, the highest incidence being in March and April.

In regard to treatment the convulsions may be controlled by the administration of 15 to 25 c.c. of a sterile 8 per cent solution of magnesium

sulphate injected subcutaneously. As the convulsions are a result of the low calcium content of the blood, calcium chloride should be given. The amount should be 15 grains four or five times a day for the first two days; then the number of doses should be reduced to three a day. This should be continued for three weeks. The calcium chloride may be dissolved in a little water and placed in the feedings. Cod liver oil should be started, 1 drachm t.i.d., and continued for a long period. If possible the infants should be exposed to the direct rays of the sun.

### SCURVY

Scurvy is caused by a deficiency in the diet of the anti-scorbutic substance called vitamin C. The symptoms of scurvy are pain on being handled, bleeding and swelling of the gums around the teeth, blood in the urine or stools, and swelling at the ends of the long bones. The swelling is due to a hæmorrhage under the periosteum. This at first glance may appear as a swelling of the joint which often leads to the mistaken diagnosis of arthritis of rheumatic origin. Enlargement of the costo-chondral junctions is also present, but this enlargement is more angular than that found in rickets. Seventy-five per cent of the cases encountered in this hospital occurred in infants from 8 to 12 months of age. It is rarely seen in those more than one and a half years of age, which is of considerable value in the differential diagnosis of scurvy and rheumatic arthritis as the latter condition is practically unknown under three years of age. The treatment consists in the prolonged administration of one half to one ounce of orange juice twice a day. This may be added drop by drop to the cold feeding. If diarrhœa is produced, twice the amount of canned tomato juice may be used. Every infant more than five months old should receive at least two drachms of orange juice a day as a prophylactic measure.

### INTUSSUSCEPTION

Intussusception is an invagination of the bowel within itself. It usually starts at the ileo-cæcal valve. The outstanding symptom is sudden onset of pain in a previously healthy infant. The parent can generally remember the exact time of the onset of the symptoms. Vomiting begins, and, usually after the passage of one normal stool, the typical red currant jelly stool appears. This consists of mucus and blood. Rarely the stool may consist almost entirely of mucus with only a little blood. Examination of the relaxed abdomen reveals a sausage-shaped tumour, usually lying transversely across the upper part. It is frequently necessary to give a little anæsthetic to produce relaxation. Rectal examination will disclose the typical stool, and if the condition has been present long enough the head of the intussusception may be felt. In a few hours shock-like symptoms appear, due to the absorption of toxins from the obstructed bowel. Sixty-five per cent of cases occur in infants from four to ten months old and only an occasional case in children over eighteen months of age. The treatment consists in the immediate reduction of the tumour by an abdominal operation. A delay of a few hours may be fatal. The prognosis depends upon the man who first sees the case.

### ACUTE INTESTINAL INTOXICATION

Acute intestinal intoxication is a shock-like condition which results from the absorption of toxins from the gastro-intestinal tract. The toxin is probably of a split-protein nature. The intoxication is practically always preceded by diarrhœa. The outstanding symptom is progressive drowsiness, accompanied by vomiting. Pallor or cyanosis may result from the effect of the toxin on the circulation. The liver is usually enlarged. The treatment consists in the withdrawal of all food, and the oral, intravenous, and subcutaneous administration of glucose until the drowsiness has been absent for one or two days. Gradually increasing quantities of two per cent lactic acid milk may then be offered. If the drowsiness is marked a transfusion of blood is indicated. In very severe cases an exsanguination-transfusion is a life-saving procedure. The mortality even with the best of treatment is very high.

### MONGOLIAN IDIOCY AND CRETINISM

These conditions of defective mental development are frequently not differentiated by the family physician. The vast majority of Mongolian idiots are referred with a diagnosis of cretinism. A survey of the records of this hospital show that Mongolian idiots are encountered more frequently, as during the past five years forty-three Mongolian idiots were admitted and only twelve cretins. The facies of the Mongolian idiot is quite characteristic. The eyes are almond-shaped, and slant downwards and inwards. The epicanthic fold is marked. These

characteristics become more evident when the child cries. The tongue usually protrudes, and only in this respect does the appearance of the Mongolian idiot resemble the cretin. In a number of cases the external ear is crinkled, due to maldevelopment of the cartilage. Congenital defect of the heart or palate is frequently present. The head tends to be flattened from before backwards. The hands are short and stubby, and the little finger is frequently curved inwards ("baseball finger"). Hypotonicity of the body is marked and the feet can readily be placed behind the head. These infants are subject to frequent head-colds, and usually die of a bronchopneumonia during the first two years of life. No treatment improves the condition.

Cretinism is the result of a congenital deficiency or absence of the thyroid secretion. The features are coarse. The skin is dry and doughy but does not pit on pressure. The nose is broad, the lips thick, and the jaw heavy. The tongue is large and protuberant. The whole face presents the appearance of having been pushed back, with the force applied at the bridge of the nose. The hair is coarse and wiry. The extremities are short. The temperature tends to be subnormal.

The administration of thyroid extract produces a marked improvement in from one to two months. This treatment has to be continued throughout life. The dosage at first is usually about one half a grain three times a day, which is not increased as long as the patient shows physical and mental improvement. If necessary as much as 10 to 15 grains may be given daily.

Evidences of over-dosage are, increased perspiration, pallor, prostration, and an abnormally high pulse rate. Although the physical development may become normal these patients are always mentally backward.

### HEART MURMURS

Heart murmurs may be divided into three groups, congenital, functional, and acquired. The congenital heart murmur is present from birth. It is loudest over the base or body of the heart, and the intensity varies from the very faintest sound to the loud "machinery" type of murmur. The intensity of the murmur bears no relation to the severity of the lesion. Enlargement of the heart takes place to the right. Functional murmurs also occur over the body of the heart and are not transmitted. Although the exact cause is not known they are usually considered to be the result of changes in the blood due to anæmia, or to dilatation of the heart as the result of some febrile condition. They are always of a very soft blowing systolic character and frequently disappear on exercise. Indeed, they tend to disappear spontaneously. Examinations over a long period may be necessary in order to make a definite diagnosis. Acquired heart murmurs differ considerably from the above mentioned conditions. A point of very great practical value in the differential diagnosis is that acquired heart disease is quite rare under four years of age. The character of the acquired heart murmur in children is the same as in adults. The murmurs most frequently encountered are systolic in time, heard best at the apex, and transmitted towards the axilla. Enlargement of the heart is toward the left. A history of sore throat, rheumatism, or chorea is usually obtained.

### OTITIS MEDIA

Inflammation of the middle ear is a condition which is frequently overlooked. During the past five years no less than 2,094 cases were encountered in the medical service of this hospital. The frequency of this condition in infancy is due to the prevalence of upper respiratory infection, in conjunction with the short straight Eustachian tube of infancy which allows easy access of the infecting organism to the middle ear. The presence of otitis media should always be considered in any infant with an unexplained fever, as this may be the only symptom. Usually however the infant is irritable. As a result of the infection a gastrointestinal disturbance may develop. The infant practically never indicates the presence of pain in the ears. If the resistance of the patient is low, there may be little or no elevation of temperature. Otitis media is invariably secondary to a nasopharyngitis. Accordingly, the ears should always be watched carefully in any upper respiratory infection. Examination is most readily made by means of an electric auriscope. If the drum is reddened the condition may be treated by the administration of 1 to 2 drops of warm Keith's dressing in the ear every 4 hours. If bulging occurs, paracentesis in indicated, followed by dry wiping or syringing.

### PYELITIS

Pyelitis is an infection of the pelvis of the kidney, which in severe cases extends into the kidney substance itself, producing a pyelonephritis. The symptoms are, a high widely fluctuating

temperature with a sudden onset, frequently preceded by a chill, and occasionally a convulsion. There are frequency of micturition and loss of appetite. A history of frequency is difficult to obtain in infancy. In severe cases the patient becomes quite toxic. The physical signs are usually negative, but occasionally large tender kidneys may be palpated. A definite diagnosis can only be made by a microscopical examination of an uncentrifuged specimen of urine. The urine may be collected in the male by strapping an ordinary test tube on the penis. With the female a female infant urinal, or an ordinary glass bird-seed container may be held against the vulva by the diaper. Examination of the urine shows the presence of a large number of pus cells. Occasionally, due to the blocking of a ureter, the pus cells appear intermittently. Therefore, it may be necessary to examine two or three specimens, before the pus is found.

The age and sex incidence of the disease is of interest. Eighty per cent of the cases encountered at this hospital occurred in females, and more than 50 per cent of the cases were infants from three to eighteen months of age. The disease is uncommon under three months. The treatment consists in the administration of sufficient potassium citrate to make the urine alkaline. This may require from 40 to 300 grains per day. The average case requires 15 grains to 25 grains dissolved in 2 drachms of water, and administered 5 times per day, at an interval of 4 hours. The urine must be kept alkaline for a period of about one year, otherwise the disease will recur.

### AMMONIACAL DIAPER

The chief symptom of this condition is the presence of free ammonia in the wet diaper. Frequently, the ammonia is so strong that it "makes the eyes water" when the diapers are being changed. As a result of the local irritation produced by the ammonia there may be excoriation of the buttocks and genitalia; indeed, in many cases the infant is brought to the physician on this account. The condition is due to decomposition of the urea and ammonium salts in the urine with the resultant liberation of ammonia. The whole process takes place in the diaper after the urine is passed. Different theories have been advanced to explain this condition. Some authors believe it is due to the presence of certain bacteria in the diaper which act rapidly on the urea and the ammonium salts with the liberation of ammonia. Other writers consider the ammonia the result of the action of traces strong soap left in the diapers. The question is not settled at the present time.

The treatment is very simple. One-third of a teaspoonful of baking soda (sodium bicarbonate) is given daily in each of three feedings. This results in the replacement of some of the ammonium salts in the urine by sodium salts. The amount of fat in the milk should be reduced, as this diminishes the amount of acids excreted in the urine. These acids frequently require ammonia to neutralize them. The diapers after being washed should be soaked for an hour or two in a saturated solution of boracic acid. They should then be thoroughly rinsed before use. This both sterilizes the diapers and removes any trace of soap. If these measures are carried out the odour of ammonia almost invariably disappears. The excoriated areas on the skin should be washed with olive oil, and then covered with cornstarch. Exposure of the parts to the air facilitates healing.

### RETROPHARYNGEAL ABSCESS

This disease, which is not uncommon, is almost invariably overlooked, in spite of the fact that it can be readily diagnosed. During the past year 11 cases were admitted to this hospital, practically all of which occurred during the winter months. It is usually encountered in children less than two years of age. The condition is an acute inflammation of the retropharyngeal glands, which are situated on both sides of the midline posterior to the pharynx. It is always secondary to a nasopharyngitis. The prominent symptoms are noisy, snoring respirations with the mouth open, and retraction of the head. These symptoms are due to pressure on the larynx. An external swelling below the angle of the jaw is almost invariably present. The disease can only be diagnosed with certainty by palpation with the finger in the mouth. If no teeth are present a gag is unnecessary. A circumscribed mass can be felt on the posterior pharyngeal wall just lateral to the midline. Some cases of retropharyngeal adenitis do not go on to abscess formation. When definite fluctuation is present, the mass should be incised. The use of either an anæsthetic or an external incision is positively contraindicated. The patient, pinned in a blanket, is laid on the back with the head extending over the edge of the table. A mouth gag is inserted. It is essential that the knife used be wrapped with adhesive

so that only the terminal eighth of an inch of the blade is left unguarded to penetrate the tissues. Guided by the left index finger, a transverse incision is made across the most fluctuant portion of the mass. The knife is withdrawn and the index finger rapidly inserted in the opening and any adhesions broken down. The child is immediately turned on its face to allow escape of the pus. The procedure as outlined must be carried out rapidly, in order to prevent the aspiration of pus. Convalescence is rapid.

### EXANTHEM SUBITUM OR ROSEOLA INFANTUM

This disease occurs usually in infants less than eighteen months of age. The onset is abrupt, beginning with a high fever of a fluctuating nature which persists three to four days. Usually on the fourth day, the temperature falls by crisis, and there appears a pink maculo-papular rash which persists for one to three days. As the rash fades there frequently appears a fine branny desquamation. The disease is contagious and there is complete absence of complications or sequelæ.

Exanthem subitum occurs most frequently in the late summer and early autumn, and during the winter months. The fever ranges from 101° to 105°, with a tendency to morning remissions. The patient, in spite of the high fever, is usually carefree and happy which is of considerable diagnostic importance. The catarrhal symptoms of measles are absent. There may be slight congestion of the throat, conjunctiva, and buccal mucous membranes. Usually on the second or third day of the febrile period there occurs a general glandular enlargement, though often only the cervical and posterior auricular glands are involved. In many cases the enlargement of these glands persists for weeks. On the third to fifth day of the disease the fever falls by crisis, and usually coincident with this the rash appears, at first on the trunk, then spreading to the neck, face, posterior auricular regions, and the proximal half of the extremities. It is a bright pink or rose coloured maculo-papular rash. The maculo-papules in some cases coalesce, which may make the rash almost indistinguishable from that of measles. The spots disappear on pressure After one to three days, the rash fades, frequently leaving a fine branny desquamation. A characteristic blood change is the presence of a leucopenia, with 70 to 85 per cent of lymphocytes.

There is no other exanthem in which the eruption is consistently coincident with defervescence, and with the disappearance of all signs of illness.

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## SPONTANEOUS CEREBRAL HÆMORRHAGE*

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THAT the title of this paper may possess the flavour of the uninteresting and commonplace is freely admitted. That many of us here to-day may entertain the idea that in the study of brain hæmorrhage little remains to stimulate our imagination or arouse our interest is further admitted. And yet it is only within the last very few years that spontaneous cerebral hæmorrhage has attracted anything like the attention that it deserves. Because of this awakening interest, and the mental ataxia which attended my own earlier recognition of the condition, I have ventured to bring it up for our consideration.

I trust that I am casting no undue aspersion upon our profession when I suggest that the term itself awakens only but one very definite mental picture in the mind of the average physician. He conjures up the figure of an oldish person, with well-advanced arteriosclerosis, lying in a comatose or semi-comatose state, completely hemiplegic, and awaiting only the final flicker of the flame of life.

It is not, however, of this clear-cut picture of intra-cerebral hæmorrhage, which I am sure we all recognize at a glance, that I propose to speak. Rather do I wish to attract your attention to a vast series of sudden hæmorrhagic disorders, occurring in or upon the brain, at all ages, and under unrecognized pathological conditions. If,

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on the one hand, we eliminate from our consideration definitely intracerebral hæmorrhage due to vascular disease; and, on the other, such clear cut and well-recognized conditions as subdural hæmorrhage of traumatic origin, we still encounter a miscellany of hæmorrhagic conditions none the less numerous and vastly more interesting.

First in importance among these should be placed subarachnoid hæmorrhage, a term recently added to our nomenclature to denote sudden spontaneous hæmorrhage between the arachnoid and the brain surface. The onset is characteristic, probably more so than in any other type of cerebral hæmorrhage. The patient, while in the full enjoyment of his usual good health, is suddenly stunned. He has the sensation of being struck on the head as if from behind. Intense headache supervenes, and he rapidly but steadily passes into unconsciousness. Gradually the breathing becomes stertorous, the pulse slowed, and the pupils dilated, indicating the gradual development of cerebral compression. In contradistinction, however, to intracerebral hæmorrhage, we find few, if any, localizing signs. Rather is there a general paresis with bilateral manifestations. In the severer types, the patient is quite unconscious; breathing is stertorous; the pulse slowed; the pupils dilated, sometimes unequal and occasionally inactive to light. Muscular tone is at first increased, but gradually, in the course of a few hours, passes through hypotonia to complete flaccidity. Reflex activity is increased throughout and accompanied by such pathological reflexes as the Babinksi, Oppenheim, or Chaddock phenomena, ankle or patellar clonus, and even absence of the abdominal reflexes. Commonly, these pathological signs are equally manifest on both sides, though occasionally they evidence a preponderance of pressure on one or other side. Never, however, does one see complete hemiplegia, as in intracerebral hæmorrhage.

A quite different picture may be observed in the less severe cases. Often one sees here evidence of meningeal or cranial nerve irritation, accompanied by restlessness, irritability and mental confusion rather than the well-marked coma of the more severe cases. Cervical pain, with retraction of the head and a more or less well-marked Kernig sign, further complicate the picture, and are frequently responsible for the diagnosis of meningitis, until the spinal fluid examination renders this diagnosis untenable. In both types, however, the onset is similar. A sudden attack of pain, as if something had snapped in the head, and gradually developing weakness characterize both. The diagnosis of subarachnoid hæmorrhage, while inferred from the clinical history and findings, must depend, finally, upon the examination of the spinal fluid.

A not uncommon clinical finding in these cases is that of massive albuminuria, or glycosuria, which naturally enough suggests to the physician's attention either uræmia, in the first case, or diabetic coma in the second. The hæmorrhage in these cases is essentially irritative and, as might be expected, settles on or about those basal structures irritation of which is known to set up glycosuria or albuminuria. The transitory nature of these findings, the blood chemistry and, finally, the spinal fluid findings, suffice to eliminate the possibility of either condition in the genesis of coma of this type. While the level of nitrogen retention is frequently raised above normal, it is never comparable to that of true uræmia.

Whether, however, one is dealing with the severe comatose type or the irritative meningeal type, the diagnosis must ultimately rest upon the examination of the spinal fluid. This examination should not be undertaken without first noting the actual pressure in the spinal canal, for which the use of the manometer is essential. So high is the pressure reading in most of these cases that the ordinary mercury manometer is quite inadequate. Normally, this apparatus registers from 8 to 12 mm. of Hg., while under pathological conditions the readings may be as high as 60 mm. In the cases under discussion, the readings ranged from 25 mm. to 55 mm., all being materially elevated but, as would be expected, registering the higher levels in the severe comatose type of case. Just one word in passing on the commonly employed practice of estimating spinal pressure by the drop method. Fundamentally, it is unsound and, practically, it is misleading and worse than useless.

In the first few days, blood is always present and is uniformly distributed throughout the fluid. It does not clot after standing, as may be the case if due to needle trauma. After the

first few days, the blood tends to disappear, but continues to disclose itself in the appearance of xanthochromia, the yellowish fluid which indicates a previous hæmorrhage. The rapidity of this disappearance of blood cells is rather remarkable, and the passage from frank blood to xanthochromatic fluid is marked by certain cytological phases which, if not understood, may be responsible for serious diagnostic error. Following the fragmentation and final dissolution of the red corpuscles, leucocytes and lymphocytes appear in great numbers, constituting, no doubt, the phagocytic agents by which this dissolution is brought about. This leucocytic phase, if unappreciated, tends to confuse the picture and presents further confirmation of the diagnosis of meningitis.

The spinal fluid, then, presents various consecutive phases which, if properly understood, establish unassailable evidence of hæmorrhage. The successive stages of uniformly blood-stained fluid under pressure giving place to xanthochromia; of leucocytic passing to lymphocytic invasion, and, finally, to clear fluid, give us our *sine qua non* of subarachnoid hæmorrhage.

The first type of case may be illustrated with the following histories.

CASE 1

F. C., 52 years old, a heavily built, plethoric engineer, was admitted to the Montreal General Hospital in September, 1927, a few hours after a sudden attack of pain in the head. He believed he was struck on the head with a hammer. His past history was uneventful: always a hard worker; smoked moderately; took an occasional drink; denied venereal disease. In the course of one hour he became fully unconscious, and five hours later was examined in the ward. His breathing was stertorous; pulse 68-70; temperature 101¾° F. The general muscular condition was one of hypotonia, with intermittent, spasmodic contractions of the right arm; no localized paresis. The pupils were dilated, regular, sluggishly reactive to light. The eyes were fixed in mid-position. The eye grounds were normal.

All the deep reflexes were hyperactive and intensified on the left side. Bilateral Babinski and Chaddock phenomena were noted, and there was a well-sustained ankle clonus on the left side. Abdominal reflexes were doubtfully present. Tendon jerks of the upper extremities were present throughout, but intensified on the left side. A crude sensation to pain was noted to be present on both sides, inasmuch as there was withdrawal response to prick. Kernig's sign was not elicited.

*Spinal Fluid.*—Pressure with the mercury manometer was 38 mm. (normal 8-10); the fluid was uniformly blood-stained, but showed no clot on standing. The Wassermann test was negative.

*Blood.*—Red blood cells, 490,000 per c.mm. No abnormal red cells were seen; hæmoglobin 85 per cent (Dare); white blood cells, 12,400. The relative proportion of white cell elements were maintained. Urea nitrogen was 17 mgm. per 100 c.c. The Wassermann test was negative.

*Urine* was clear; sp. gr. 1018; reaction, acid; albumin ++; sugar + (Fehling's); no casts or red cells.

X-ray examination of skull revealed no abnormality.

*Cardio-Vascular System* was normal; blood pressure, 138-85.

The spinal pressure was gradually reduced daily until 14 mm. Hg. was registered; and in the course of eight days the patient passed from the unconscious state to one of delirium and disorientation for place and time; from this to mild confusion and, ultimately to his normal mental state. Along with this general improvement, his normal muscular tone became re-established and all reflex activity took on its normal expression. At the end of the fourth day, the temperature curve became normal and remained so. Six days following the initial puncture no red cells could be found in the spinal fluid, but numbers of leucocytes and lymphocytes were in evidence, while a distinct yellowish colour preceded the clear fluid observed during his last days in the hospital. All evidence of albuminuria disappeared four days after admission. Two weeks after discharge, or eight weeks after the initial hæmorrhage, he resumed work as engineer on a fast passanger train and has remained on full duty since.

CASE 2

The second case is that of a woman, aged 35, whom I saw in consultation with Dr. Illievitz, and was kindly permitted to follow throughout her illness.

Suddenly, on the morning of March 20, 1927, while talking to her family, she was taken with severe pain in the right side of her head. She clapped her hand to her right forehead and clutched at her hair, gradually sinking into semi-unconsciousness, in which state she was admitted to the hospital, two hours after onset of pain. During this period, she vomited several times and spasmodic contractions of the left arm and forearm were noted. Her past history revealed nothing of significance.

On admission, she was obviously in pain, tearing her hair, clutching at her head and making such an uproar that hysteria was suggested by one physician who saw her. The temperature was 100.2°; pulse, 62; respirations, 20. She remained conscious throughout her illness, though for several hours she was stuporose and confused, being aroused to the conscious state with considerable difficulty. The pupils were dilated and unequal, the right being the larger, and both reacted to light sluggishly; no nystagmus; no ocular paresis. The eye-grounds were normal on admission, but, three days later, showed moderate bilateral papillœdema, and in the periphery of the left retina numerous petechial hæmorrhages in the superficial layers (Dr. Rosenbaum). Ten days later, the swelling and hæmorrhage had disappeared, and a left-sided homonymous hemianopsia was discovered. No paresis of the face, arms or legs could be made out, but muscle tone was definitely increased on both sides and particularly so in the left arm and leg. Infrequent spasmodic contractions of the left arm continued for several days. Sensation of all forms showed no demonstrable impairment. All tendon jerks were exaggerated, the knee and ankle jerks on the left side being definitely hyperactive. Both plantars were extensor in type, and there was a well-sustained ankle clonus on the left. The abdominals could not be elicited. Kernig's sign was present on both sides, and there was well-marked retraction of the head.

*Spinal Fluid.*—The spinal fluid was uniformly blood-stained, did not clot on standing and was under a pressure of 35 mm. Hg. This was daily reduced by repeated lumbar punctures until 12-15 mm. Hg. was recorded. The centrifugalized specimen showed a faint, yellowish tinge to the supernatant fluid which, as the red cells disappeared, gradually deepened to a definitely xanthochromasia. Leucocytes and lymphocytes were

abundantly present after the sixth day. On discharge, May 2nd, the spinal fluid was normal, with the exception of a persistent positive Pandy reaction for globulin. Wassermann reaction in blood and spinal fluid was negative.

*Blood Chemistry.*—The blood sugar was 0.186 per cent; creatinine, 1.2 mgm. per 100 c.c.

*Urine.*—Clear; sp. gr. 1022; acid; albumen +; sugar, qualitatively present to Fehling's test. Both sugar and albumen disappeared from the urine before she left the hospital. The cardio-vascular system was normal; blood pressure 120-85.

This patient made a complete recovery, and resumed her household duties five weeks after the onset of her illness. Clinically, the earlier findings in this case closely simulated meningitis. The severe headache, the slight temperature curve, the head retraction, and the Kernig sign were given their proper significance only after the spinal fluid findings were revealed.

These two cases have been selected from five of a similar nature, as clinical illustrations of that very definite entity amongst brain hæmorrhages in general, spontaneous subarachnoid hæmorrhage.

## DISCUSSION

Anatomically, bleeding into the subarachnoid space may occur in one of several ways: (1) directly from one of the larger vessels lying in the space itself; (2) from extension of an intracerebral hæmorrhage, either into the subarachnoid space itself or, if more deeply placed, into one of the ventricles; (3) as a result of trauma, in which case both subdural and subarachnoid spaces may be inundated. By the term spontaneous subarachnoid hæmorrhage we refer only to those cases which are included in the first type.

I am convinced that many of the cases of type 2 are etiologically and pathologically identical with those of type 1; but inasmuch as they are marked by evidence of brain tissue destruction, from which complete recovery seldom if ever takes places, most authorities on this subject exclude them from the picture of spontaneous subarachnoid hæmorrhage. Later, however, some interesting examples of this class will be referred to. Obviously, type 3 cases of traumatic origin, have no place in this discussion.

Most cases of spontaneous subarachnoid hæmorrhage may be classed under one or other of two groups, which, after all, merely represent degrees of severity in the same clinical process. In those cases of lesser severity, as illustrated in Case 2, the predominant feature is one of meningeal irritation. The initial headache persists, and is followed by head retraction and the Kernig phenomenon. There is partial retention of consciousness throughout or, at most, only a temporary loss of consciousness, associated with the initial shock. The mental state is often one of confusion and disorientation, while Korsakoff's syndrome has been reported by some authors. The severer cases, on the other hand, present, rather, the picture of cerebral compression, with early developing and persistent coma, dystonia and increased reflex activity. These constitute the apoplectiform type, and, indeed, the differentiation from intracerebral hæmorrhage is not always easy. It may be only after recovery has taken place that the absence of evidence of brain tissue destruction, with complete disappearance of all signs, establishes the differential diagnosis.

Between these two extremes lie cases of varying degrees of severity, exhibiting features of one or other type or, as may be the case, of both. Not infrequently, the apoplectiform type assumes the meningeal syndrome during the process of recovery. Common to both types are those characteristic features upon which one must rely for diagnosis of the condition: (1) the sudden onset, often in apparently healthy individuals, with severe pain and the sensation of "something having snapped in the head"; (2) the rapid development of signs of cerebral compression or meningeal irritation, according to the severity of the rupture and rapidity of the bleeding; (3) usually a mild elevation of temperature with a moderate slowed pulse; (4) the development in some cases of papilledema and hæmorrhagic retinitis; (5) the development, in some cases, of glycosuria and massive albuminuria. (6) finally, and essentially, the characteristic spinal fluid findings.

## DIFFERENTIAL DIAGNOSIS

In recent years, the great clearing house of neuropsychiatric difficulties in diagnosis has been encephalitis lethargica, and it is not in the least surprising that many of these sudden hæmorrhagic disasters should have been placed in this category. The somnolence, with signs of meningeal irritation, and the mild elevation of temperature, frequently indicate inflammatory disease with encephalitis lethargica or meningitis in the foreground. Both these diseases, however, are readily excluded by the examination of the spinal fluid. The not infrequent finding

of sugar or albumen in large quantities in the urine may direct the physician's attention to diabetic coma or uræmia, but, here again, the state of the spinal fluid and the estimation of nitrogen retention in the blood suffice to throw these two conditions out of court.

More difficult of interpretation are those cases in which the blood in the subarachnoid space has arisen from the rupture of an intracerebral hæmorrhage, either directly into the subarachnoid space, or indirectly by way of the ventricles. It may be quite impossible in some cases to satisfy one's self that these possibilities are excluded, but the presence of evidence of brain tissue destruction, such as a frank hemiplegia or aphasia, point to the cortex or subcortex as the site of the primary rupture.

The onset, course and termination of some of these intracerebral hæmorrhages are so similar to those under discussion that there appears little justification for their exclusion from the clinical picture of spontaneous subarachnoid hæmorrhage. In the present state of our knowledge—or, rather, lack of knowledge—of the pathology of spontaneous hæmorrhage in young and apparently healthy persons, it would appear that the question of type—intracerebral or extracerebral—is an accidental one depending upon the site of the initial lesion. In elucidation of my contention in this matter, I will outline two cases which, but for the site of the initial ictus, must have been readily classed as cases of spontaneous subarachnoid hæmorrhage.

### CASE 3

A healthy boy, of 13 years, seen in consultation with Dr. Harry Shaw. His previous history was devoid of any untoward happening and he was regarded as exemplary, physically, mentally and morally. Shortly after going to bed on November 1, 1926, he was suddenly seized with intense headache, vomited several times and quickly passed into coma. This coma wore off and when seen in the early morning he was conscious, suffering pain, intensely irritable, and throwing himself about the bed. The pulse was 48; temperature 99.2°; respirations, 24. Pupils were equal, regular, and showed a normal reaction to light. The fundi of both eyes showed no apparent abnormality; no nystagmus. No ocular, facial, or limb paresis. The neck muscles were rigid, with well-marked retraction of the head; and there was a strongly positive Kernig's sign on both sides. The deep reflexes could not be elicited and the plantars were normally flexor in type. The abdominals were present and equal on both sides.

The impression was that the case was one of cerebro-spinal meningitis.

*Spinal Fluid.*—This was under pressure of 25 mm. Hg., and was deeply and uniformly blood-stained. The supernatant fluid showed a definite yellowish tinge, which gradually deepened from day to day into xanthochromia. An increase in the white cell elements was noted on the first examination; and later the lymphocytic variety especially became very numerous, as the red cells tended to disappear. Cultures of the fluid remained sterile.

Rapid and satisfactory recovery was made from this initial hæmorrhage, so that by November 16th he was apparently quite well. No pain or headache; no objective signs of cerebro-spinal injury. The spinal fluid contained no red cells, but was markedly xanthochromatic. He was eating, sleeping and acting normally.

On November 18th he was again seized with headache, vomiting and, in a very few minutes, coma. There was violent spasmodic twitching of the right face, arm and leg, while the left arm and leg were in a state of flaccid paresis. The head was held rigidly towards the left, and the eyes turned towards the right. The pupils were equal, dilated, and reacted to light. Deep reflexes were exaggerated, but equal. Bilateral Babinski and Chaddock phenomena were present, with bilateral ankle clonus. Abdominals were absent on both sides.

Examination by Dr. MacMillan showed bilateral hæmorrhagic retinitis, with many small hæmorrhages into the periphery of both retinæ; suggestive swelling of the temporal side of right disk. There was paresis of the external rectus on the left side.

*Spinal Fluid* showed pressure 30 mm. Hg. and was deeply blood-stained. No clot on standing.

Again improvement set in and once more he returned to normal activity. During this phase of normality, Dr. Waugh made a complete examination of his blood which he summarized as follows: "There is nothing in the blood picture to suggest blood disease as the cause of the cerebral condition. No hæmorrhagic diathesis. The pathological features are the high viscosity and concentration of the blood, producing anhydræmia. This is probably due to fluid depletion. The relatively high bilirubin content speaks against any extensive hæmorrhagic extravasation."

On November 28th, the spinal fluid was deeply coloured, with a high white cell count. On November 30th he had a sudden seizure, for the third time, with headache, coma, and flaccid paralysis of both sides and with bilateral Babinski and ankle clonus and absent abdominal reflexes.

After lumbar puncture which again showed bloody fluid, he regained consciousness for several hours but gradually sank back into unconsciousness, with a pulse of 34, and Cheyne-Stokes respiration. He died on December 2nd.

*Autopsy Findings.*—The brain only was examined. Dr. Conner reported as follows: "The brain is large. The convolutions are flattened and the whole is covered with recent blood. A mass of blood has broken through the anterior part of the left lateral ventricle. On section, a large hæmorrhage is present in the cortex of the left hemisphere. All the ventricles are filled with blood as far back as and excluding the 4th ventricle. The original hæmorrhage appears to have been in the cortex outside the ventricle and to have broken through to the subarachnoid space and into the left lateral ventricle. After washing away the blood, an exhaustive examination of the vessels failed to reveal the presence of aneurysm or rupture in the wall of one of the larger vessels.

"Numerous sections from various portions of the brain were examined microscopically. These, in general, show cerebral cortex or portions of basal ganglia with hæmorrhage. In no section is there any line of demarcation between hæmorrhage and brain substance. The immediately surrounding tissue is made up of degenerating nerve and glial cells in which there are many phagocytic cells containing blood pigment. There is a condensation of neuroglial cells in places, but there is no evidence here of a neuroglial tumour. No mitotic figures are found; no separation from the more normal tissue can be demonstrated; and the contiguous

blood vessels do not show the endothelial proliferation common in the vicinity of neuroglial tumours.

"The few nerve cells observed are somewhat swollen and show with phosphotungstic acid-hæmatoxylin stain a few Nissl granules indicative of degeneration. There seem to be more satellite cells around them than usual. The hæmorrhage, in bulk, is rather recent, but evidence of old hæmorrhage is present in the numerous pigmented endothelial cells around the blood. In this area, in addition to the pigmented cells, there are many large, swollen, vacuolated cells, commonly known as *gitterzellen*.

"No defect of blood vessels can be found. Those large enough to have muscular and elastic tissue walls show no change from the normal. The smaller ones are dilated in the region of the hæmorrhage, but an actual rupture cannot be demonstrated."

CASE 4

A young man, 31 years old, whose health was always excellent. There was no record of any previous disease or ill-health and, with the exception of strong addiction to alcohol, his past history was free from comment.

On December 7, 1927, he was admitted to the Montreal General Hospital unconscious and hemiplegic, with the report that he had been perfectly well when he had retired at 11 o'clock the previous night. In the morning, his wife found him in an unconscious state and unable to move his right arm or leg. On admission he was deeply somnolent, but could be aroused to apparent consciousness. He could not speak, however, and gave little sign of recognition of his surroundings. The temperature was 100.3°; pulse, 60-64; respirations, 18-20. The pupils were equal, small, slightly irregular, and did not respond to light. There was complete right-sided hemiplegia involving face (lower), arm, and leg. He could mumble a few, indistinct and unrecognizable sounds. The eye fundi were normal on admission. All deep tendon reflexes were greatly exaggerated on the right side, while positive Babinski, Chaddock, Oppenheim, and Hoffman reflexes were obtained on the right side. Ankle clonus and absence of the abdominal reflexes were noted on the right side. All reflex activity on the left side was normal. The cardio-vascular system was normal. The blood pressure was 140-100; on discharge, 120-80. The radial arteries were soft and easily compressible.

*Urine.*—Acid; sp. gr. 1022; albumin +++; sugar, negative to Fehling's; no casts or red blood cells were seen

*Spinal Fluid.*—Pressure, 50 mm. Hg. The fluid was deeply and uniformly bloody. The pressure was gradually reduced to 25 mm. Hg., with marked improvement in his mental state. Repeated daily lumbar punctures, over a period of ten days, reduced the pressure to 15 mm. Hg.

The spinal fluid in this case was typically that of subarachnoid hæmorrhage, and passed through the stages of red cell absorption, xanthochromia, leucocytic and lymphocytic invasion to clear fluid with excess of globulin.

Ten days after admission, the optic discs began to show blurring with venous congestion, and on February 3rd Dr. Mathewson reported "Definite optic neuritis in both eyes with a few superficial retinal hæmorrhages."

Before discharge on March 1st, all signs of diseased fundi had disappeared. The blood and spinal fluid Wassermann tests were, on several occasions, negative. A mild luetic curve in the colloidal gold was accounted for by the presence of blood pigments. The nitrogen retention and blood sugar curves were found to be within normal limits.

After reduction of the spinal pressure to lower limits consistent with life, his mental confusion and somnolence completely cleared up and definite improvement took place in his speech. While still showing defect in the receptive speech mechanism, emissive speech was almost normal. The hemiplegia disappeared, so far as movement indicated, but evidence of pyramidal tract involvement on the right side was still present in the persistence of the Babinski, Chaddock, and Oppenheim phenomena, and the absence of the abdominals on the right side. In addition, a decided limp and hypertonia of the right arm marked the irreparable damage to the pyramidal system. The pupils, which on admission were small, slightly irregular, and inactive to light, resumed normal size and activity with the return of normal intraspinal pressure.

In Cases 3 and 4, we have definite evidence of brain tissue destruction; in Case 3 in the autopsy findings, and in Case 4 in the no less reliable evidence of persistent pyramidal impairment and aphasia, which could be due only to a destructive lesion in the left cerebrum.

While anatomically they cannot be classed as subarachnoid, yet in the suddenness of onset, the spontaneity, the incidence in young and heretofore healthy persons, in whom no evidence of cardiac, vascular or blood disease could be discovered on repeated examinations; and finally, in the failure to discover any break in the continuity of the cerebral vessels in Case 3, we are forced to admit their clinical identity with Cases 1 and 2, which have been selected as types of spontaneous subarachnoid hæmorrhage.

## PATHOGENESIS

This brings us to a consideration of the pathological changes underlying this condition. I wish to say at the outset that I have had to deal with only a very limited number of cases—8 in all— of which two died; but in neither of these did exhaustive examination of the cerebral vessels reveal the cause of the hæmorrhage. A review of the literature, however, indicates a number of causes, chief among which are the causes of cerebral hæmorrhage in general, *viz.*; arterio-sclerosis, bacterial infection, toxic degenerative processes, notably chronic alcoholism and syphilis. With these known causes of brain hæmorrhage, whether of the intracerebral or the subarachnoid type, we are not concerned in this discussion. Only cases which have occurred spontaneously in the absence of any known arterial, renal or blood disease, have been considered as lying within the purview of this paper. In only one of the four cases cited was there any suggestion, from either the past history or clinical examination, of the cause, and that was in Case 4, which, though that of a young man, reported immoderate addiction to alcohol for several years. Probably, the best explana-

tion of these hæmorrhages lies in the finding of small ruptured aneurysms in many of the reported cases.

Fearnsides[1] has described aneurysmal formations and considers them to be sometimes due to an inherent weakness in the vessel wall, a local developmental defect. He speaks of congenital weakness of the arterial wall at junctional points. According to Turnbull,[5] this aneurysmal formation is not an essential factor, as the inherent defect in the vessel wall may lead to a breach in the media without the intervention of an aneurysm. C. P. Symonds[4] has collected an imposing series of aneurysms in young people, with no sign of cardio-vascular disease, and states that they are not uncommon.

Goldflom's hypothesis,[3] that a functional vasomotor disturbance analogous to that of migraine may set up capillary oozing, would appear to be based upon insecure evidence; as insecure as the evidence that links migraine with vasomotor instability.

The sudden onset with rapidly developing signs cannot be conceded to be the clinical counterpart of oozing, but rather that of frank rupture, whether or not it be preceded by aneurysmal formation. The very thorough but fruitless search for aneurysm in Case 3 is convincing evidence that such formation is not an essential precursor of rupture.

Viewing the pathological situation in the light of the little knowledge available at the present day, one feels a certain justification in the assumption that localized degeneration or softening may occur as a result of the activity of toxic or infective agents as yet unrecognized; and that this localized softening may or may not be preceded by aneurysm formation.

## TREATMENT

The only question involved here is that of the advisability of lumbar puncture for therapeutic purposes and, as usual, opinion is divided. Ehrenberg, who has been collecting material for several years, advises against the therapeutic use of puncture, though he justifies the procedure for diagnostic purposes. It is argued that sudden lessening of the pressure nullifies Nature's effort at compression and predisposes towards fresh bleeding; and, no doubt, the removal of too great a quantity at one sitting is a dangerous procedure. If, however, use is made of the manometer, and the pressure is only sufficiently lowered to maintain function in the medullary centres, by daily or bi-daily sittings during the period of active compression, there can be no question as to its advisability. I am convinced that the repeated punctures in Case 1 during the active and extreme compression, saved life. This statement applies with equal truth to Case 4.

Even in the later irritative stage, the frequent use of the needle relieves the headache and lessens the irritability, thus ensuring rest and quiet. The frequency with which puncture is followed by return of consciousness, even for a few hours, and the relief from pain and discomfort in the meningeal type, leave little doubt as to its therapeutic value.

The following precautions, however, should always accompany the puncture. (1) The manometer, as a check and register, is indispensable. (2) Only small quantities, 2 to 10 c.c., should be removed at one sitting, though in this regard let the manometer be the guide. (3) These sittings should be frequent enough to maintain a pressure compatible with life and, if possible, with comfort. (4) Generally speaking, the pressure should not be reduced by more than 10 to 15 mm. Hg., in the higher readings, and much less in the lower ones, at any one sitting. (5) The patient, of course, should always be in the lying position.

With these precautionary measures ever in mind, repeated lumbar puncture is not only a safe and sound therapeutic procedure, but offers the best chance possible for the immediate survival and continued function of the patient.

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# TYPES OF ENCEPHALITIS LETHARGICA IN NEW BRUNSWICK*

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ENCEPHALITIS lethargica, or epidemic encephalitis, incorrectly called "sleeping sickness," appeared in New Brunswick in December 1919. According to the New Brunswick Board of Health statistics, there have been nineteen deaths; nine males and ten females. In this paper emphasis will be laid, not upon the laboratory aspects of encephalitis, but upon the train of symptoms and clinical manifestations as seen by a general practitioner. The types of this disease as met with in New Brunswick do not differ from those seen in other parts of the world.

The cause of encephalitis lethargica has not been discovered, but the affection is thought to be due to a living micro-organism, which probably enters the body through the naso-pharynx. The disease is primarily one of the nervous system, affecting chiefly the basal ganglia, midbrain and pons. Microscopically, two changes can be seen in the brain; one, a diffuse toxic and degenerative lesion; the other, an inflammatory and infiltrative one. The first shows itself as a diffuse œdema and hyperæmia; the second as an accumulation of small and large mononuclears and plasma cells in the sheaths of the vessels and in the perivascular spaces.

The onset of the disease may be either sudden or gradual. The sudden onset is generally ushered in with headache, fever and delirium. The gradual onset is more common, and begins with "influenzal" symptoms, such as headache, malaise and fever. Later, meningeal irritation or mental confusion, eye changes, and somnolence appear. The disease as it progresses takes on one of many forms. These forms have been classified variously, but this paper will consider only those types which the writer has seen in New Brunswick.

The following histories will illustrate the salient features of some of the different types and will clear certain of the difficulties in diagnosis that arise.

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CASE I.

R. H. W., a factory foreman, aged 45 years, was in good health until January, 1923, when he became ill with "influenzal" symptoms. These features passed off, but later he developed diplopia, which remained for a few weeks and then disappeared. In May, five months later, his right pupil was larger and the optic disc paler than in the left eye. Refraction showed that no lenses would help his vision. In August of the same year he began to be sleepy and drowsy, and found that his work could be done only with difficulty. During the balance of the year the drowsiness became more marked, pain developed in his back, and he tired very easily.

With the increase in drowsiness all his muscles became more spastic, and with this he developed a tremor of his hands and arms which he could control voluntarily. This tremor disappeared with sleep, but was present when he was awake. In February, 1924, thirteen months after the onset, the tremor and spasticity of his muscles was marked, his speech was monotonous, his face had become expressionless, and he had a slight stoop forward when walking. These have all progressed, until to-day the tremor is very coarse, and his control of it so slight that he is unable to feed himself. There is no pill-rolling movement of the fingers. At present a Parkinson-like syndrome is marked; *i.e.*, he exhibits spasticity of his muscles with tremor, a forward stoop, an expressionless face and monotonous speech, with salivation; except that there is no pill-rolling movement, as described in true Parkinson's disease or paralysis agitans. Mentally there has been no change except the slight slowing of thought.

This history illustrates the Parkinson-like type of the disease, with its initial infection, transient eye-symptoms, drowsiness, and slow progress to Parkinsonism. These individuals can be seen in almost all the average-sized communities in New Brunswick. In many cases diagnosis is not made until the Parkinson-like syndrome has appeared.

The next history is of a different type, but through it can be seen the characteristic features of the disease. The original diagnosis was tuberculous meningitis, but after the patient began to improve a new diagnosis of encephalitis lethargica was made. As time went on, the diagnosis of encephalitis lethargica became more evident.

CASE 2

D. S., aged 9 years, a boy of kindly habits, musical, thoughtful of others, and bright at school, took sick on March 20, 1924. He complained of vague muscular pains and of cramps about the umbilicus when at stool; fever (100°-101°F.); vomiting and constipation.

Examination showed the abdomen to be markedly scaphoid with no tender points; the heart was regular with nothing abnormal noted; the lungs evidenced an old empyæma operation, but nothing further was observed. Fever and vomiting continued irregularly for about one month when he began to scream with the pain in the back

of his neck, to be very restless, extremely ugly and unlike himself. So unlike himself was he that his mother stated that when he was sick before he would do everything she wanted pleasantly.

At this time examination showed the reflexes to be active; the pupils equal, reacting to light and accommodation; the abdomen scaphoid; and slight rigidity of the recti. The following negative facts are of interest. He had neither photophobia, Kernig's sign, tache cerébrale, retraction of the head, nor changes in the ears, throat and fundi. For a week he screamed almost steadily with the pain in the back of his neck. His skin became hypersensitive, and his muscles would twitch when touched. Kernig's sign was now present. His fever varied from 97°-104°F. in a most irregular manner; heart rate, 60-90, the rhythm was irregular and the sounds of fair quality. Involuntary urination, slight albuminuria, and constipation were present. No photophobia. A lumbar puncture was done, and 15 c.c. of fluid removed, with very slight increase of pressure. The fluid was clear; eleven lymphocytes; glucose present; no globulin; no filmy clot on standing; the smear was negative for tubercle bacilli. For one week following the puncture he was less restless, the skin was less sensitive, and there was no fever. The boy only screamed occasionally and seemed better. Drowsiness then began to appear, with photophobia of the left eye. The left fundus showed engorged veins and a hazy nasal margin. Temperature was 100° F. For two weeks he became increasingly drowsy, with periods of extreme restlessness and screaming. The screaming became more frequent. The tendency to drowsiness in the daytime and restlessness at night was marked. He was very "ugly," the fever irregular, the heart action slow and irregular; urination involuntary and painful; the skin was sensitive; and the neck painful. Another lumbar puncture showed a clear fluid, with fourteen lymphocytes, glucose present, no globulin; the smear was negative for tubercle bacilli.

The boy was brighter following the puncture, stopped screaming, and was less restless, but would not answer questions. The following day he became drowsy and for a week slept most of the time. When awake he appeared bright, would look at picture books, but would not talk. The photophobia was gone and the ocular fundi appeared normal again. His condition remained unchanged for about two weeks. Then he would steal out of bed to look out of the window, but still he would not talk. About ten days later he began to say "yes" to everything, but could not be made to speak another word. He would draw pictures, climb over the top of the bed, and would attempt to get to the top of everything in the room. He would obey when spoken to.

The following incident will give some idea of his mental condition at this time. I asked him to write his name and he wrote "Donal Simmmml." His expression was that of a person confused. I did not correct him, but repeated the question on several days, and he wrote always as above. Finally, I wrote his name correctly and he copied my spelling. At the places of his former mistakes he would smile, and appeared quite pleased to have overcome his difficulties. For the next few weeks he was taught a large number of monosyllabic words, and was taught to use them intelligently. Later, a few simple mental problems were given which he learned to answer. He was very slow of thought.

About the last of August, almost five months after the onset of the disease, he began to have a slight stoop forward and a somewhat expressionless face. He developed some bad habits. He would run away from home and drive on delivery teams, pull the cat's tail, was disobedient and had a very disagreeable manner. He was mentally sluggish, would not touch the piano, and would not concentrate upon anything for any period of time. There was an absence of personality.

To-day the boy shows much the same stoop, much the same facial expression as he did five months after the onset of his illness. No other characteristics of Parkinson-like syndrome have developed. Through careful home training and education at school, starting with blocks and paper objects, etc., the boy's mental condition has improved so much that he has returned to the regular school grades to carry on his work. He is with children much younger than himself, but still is slow of thought and has become once more an obedient boy.

This patient illustrates the psychotic type of encephalitis lethargica. There was an onset of an infection resembling an intestinal disorder, subsequent eye symptoms and drowsiness, preceded by extreme restlessness, and followed by mental changes. A boy of excellent habits becomes a bad boy, develops slowness of thought, speech changes, and aphasia.

The difficulty in diagnosis is quite apparent. In children recovery is not as common as in adults, many of these children becoming a care to the State.

The next history is one which emphasizes the lethargic form of the disease and the type from which, no doubt, the misnomer "sleeping sickness" was derived.

### CASE 3

A. McC., aged 25 years, a lineman, took ill in August, 1925, with slight fever, constipation and restlessness. These symptoms lasted for a brief period, when he became drowsy and developed diplopia. The drowsiness and diplopia passed off in a few weeks and he returned to his work. For the next few months he appeared to be his former self. In February, 1926, six months after the onset of his disease, he began to have sleepy spells in the daytime. These became so marked that he would fall asleep while working on the pole as a lineman. His foreman became frightened that he would fall and gave him work on the ground. He would sit and sleep all the time, except when aroused by his fellow workmen. A nervous twitching of his muscles appeared about the same time. Examination at this time showed a marked inequality of pupils, which reacted to light and accommodation; some ptosis of both eyelids; slight spasticity of all his muscles; and some change in his facial expression. No tremor was present and his appearance was not that of the Parkinsonian type. The blood Wassermann was negative. The heart, lungs and abdominal viscera showed no abnormalities. For months he would sleep in the daytime, unless aroused, but was not so sleepy at night. His eyes remained unchanged. This patient was classified as a lethargic or somnolent-ophthalmoplegic type.

The types illustrated by the three foregoing histories have progressed and resulted in disabilities. Milder grades of the disease have been seen which did not result in severe disabilities. These milder forms may result in slight permanent speech defects or in slight permanent palsies. The following history illustrates this type of case.

### CASE 4

J. R. S., aged 40 years, a janitor, took sick on April 18, 1924, with "la grippe" or "influenza." For one week he ran an influenzal course, and then he began to talk at random, to be very stupid, and to complain of pains in his muscles. He was very restless at night, talking wildly, but showing no signs of violence. For two days he had diplopia and a temperature of 99°-102°F., irregular in type. The wild talking continued for twelve days, and then he became very drowsy and stupid. There was no fever. Throughout this period he had fine irregular twitchings of his muscles. In another week he became brighter, the twitchings were gone, but the diplopia re-

turned. The right pupil became larger than the left; both pupils reacted to light and accommodation; muscle spasticity was very slight. Two weeks later the diplopia disappeared, but the large pupil remained. From this time on he gradually became stronger and returned to his former work. To-day he shows only a slight monotony in his speech, the right pupil larger than the left, a slightly altered facial expression, and some slowness of thought. He works hard, does his work well, and, to the casual observer, he is his former self.

A number of very mild cases must be seen and pass unrecognized, owing to the difficulty of diagnosis in the early stages.

A type which unfortunately I have not seen in practice in New Brunswick is the "hyperkinetic." This has the main characteristics of the former types, but also has the severe symptoms of choreic movements or myoclonic contractions. The choreic movements may be irregular or regular; the regular, as in an extremity contracting 18-20 times a minute, or as twitchings in the abdominal muscles. The myoclonic variety may show parts of muscles contracting irregularly, due to an irritative lesion of the spinal cord. This type may go on to recovery, or may result in severe permanent disabilities. The fulminating form of this type, with death in a few hours, I have not seen in New Brunswick.

In a patient whom I saw outside of the province the choreic movements were bizarre, the restlessness extreme, the diaphragm contracting irregularly, with very difficult and irregular respiration. Death occurred in a few hours.

### TREATMENT

The treatment of encephalitis lethargica is symptomatic, no specific remedy having been found. The restlessness is improved greatly by lumbar puncture. Spasticity may be lessened by hyoscine, but will return unaltered after the drug has been discontinued. Hexamine is a useful drug and has been used in large doses in my cases. Potassium iodide and salicylates have been tried. Rest, skilful nursing, and re-education are valuable.

### COMMENTS

A review of these histories shows that a patient taking sick with "influenzal" symptoms, who in a few days becomes restless, with slight fever, and develops transient eye symptoms and persistent drowsiness, should be suspected of being ill with encephalitis lethargica. This diagnosis can be confirmed by the presence of spasticity of the muscles, painful muscular contractions, irregular involuntary twitchings, ptosis, or irregularity of pupils and by lumbar puncture. Lumbar puncture shows a clear fluid, with a very slight amount of globulin, or none at all; with increased glucose content, 10-50 lymphocytes, giving a negative Wassermann and negative for tubercle bacilli. Very often the progress of the disease must be watched in order to establish the diagnosis by the development of the Parkinsonian syndrome, or the alteration of the mental condition. Lastly, the inability to diagnose any other condition is important.

Encephalitis lethargica is more prevalent in New Brunswick than is usually thought, and it is hoped that this paper will be a means of help to the general practitioner in his efforts to recognize this disease.

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**New Sources of Broad Tapeworm Infestations: Report of Fourteenth Native Case.**—Specimens of wall-eyes and pickerel have been examined from most of the commercially important Canadian lakes, and in every case plerocercoids, which Teunis Vergeer has identified as *D. latum* have been found. Ten of these plerocercoids were taken from nine fish during the examination of a lot of forty-one wall-eyes, *Stizostedeon vitreum* Mitch., sent to him from Lesser Slave Lake. Three plerocercoids of the same species were found in three of twenty-five wall-eyes from Lake Manitoba. One plerocercoid of the same species was found in a single fish in the examination of a lot of twenty-three wall-eyes from Lac la Biche (Alberta) and one plerocercoid was found in one of fifteen pickerel, *Esox lucius* L., from Lake of the Woods. Fish from Lake Winnipegosis cannot be obtained at present because of legal restrictions, but this body of water is directly connected with Lake Manitoba and fish are able to move from one lake into the other, making it highly probable that some fish in that lake also are infested with plerocercoids of *D. latum*. All plerocercoids have been fed to dogs free from *Diphyllobothrium*. Young adults have already been recovered as a result of feeding experiments involving pleurocercoids taken from wall-eyes from Lake Winnipeg and Lesser Slave Lake. The other dogs have been infested too recently for the recovery of adults and are being kept in animal quarters. Three new cases of human infestation with the broad tapeworm have come to the author's attention during the last month. In six of the fourteen known native cases, the patients were of Jewish parentage. The ages of thirteen of the patients are known, and none of these are over eleven years old. Wall-eyes from each of the lakes mentioned are being shipped to several of the large cities in the United States, except during the closed seasons, which generally are short but vary in length for different lakes.—*J. Am. M. Ass.*, 1928, xli, 396.

# POSTOPERATIVE PULMONARY COMPLICATIONS*

BY EDGAR RAE, B.A., M.B.,

*Toronto*

THE postoperative complications involving the respiratory tract have always caused the surgeon considerable anxiety. In spite of improvements in the methods of administering anæsthetics, careful pre-and post-operative care, the refinement of operative technique, and the rapidity of operative procedure, apparently the number of such cases has not been reduced materially.

The complications consist of lobar and broncho-pneumonia, acute bronchitis, pleurisy, empyæma, embolism and mediastinitis. An analysis of the complications following abdominal operations shows that they most frequently follow septic cases and are rather rare following clean pus-free operations. This would lead one to think that it may be due more to the septic condition than to ether, or any other cause often given as an etiological factor.

Pneumonia is the most frequent and serious complication, especially the cases developing within the first two days. These cases have been often called "ether pneumonias," but improperly so, for we know that, while some of them belong to the irritation class, they are not necessarily the result of anæsthesia. In this group there is usually a sharp rise of temperature (102-104 degrees), usually without chill, associated with frequency of respiration; cough in the majority of cases, with or without muco-purulent and occasionally rusty sputum; and in many cases pain in the chest. The physical signs appear within twenty-four hours, perhaps only localized râles and diminished breath sounds, which clear up in a few days or go on to definite dullness and bronchial breathing. The cases recover in from three to ten days, or end fatally.

The cases developing during the surgical convalescent period, *i.e.*, the 3rd to the 7th day, differ little in clinical course from non-surgical pneumonia, except that a good many of them do not have subjective symptoms. Breathing is quiet, slightly accelerated, the colour good, pyrexia moderate, but the physical signs are still present. These cases do well and are not apt to be severe in type and outcome, unless associated with some exhausting surgical condition or secondary to a suppurative process in the abdominal cavity.

We have also another group occurring during the convalescent period. They are really the result of embolism with resultant pulmonary infarction. Here, the onset is sudden, with severe and persistent pain, slight cough and slight blood-stained sputum. These cases are fortunately infrequent, because they are nearly always fatal, one of the tragedies of surgical experience. Bronchitis occurs frequently but it is exceptional for it to result fatally. Pleurisy may occur as a primary lesion, or as a sequela of pneumonia, usually in the second week. Pleurisy with effusion and empyæma occurs earlier and usually follows a localized or general upper abdominal peritonitis, affording an immediate source of infection by the lymphatics. Empyæma of itself rarely follows a postoperative pneumonia.

Lung-abscess occurs very seldom in general surgery. In nose and throat surgery pulmonary abscess is a complication by reason of the likelihood of aspiration of foreign material, *e.g.*, septic plugs from infected tonsils. Mediastinitis is highly fatal. It is always a potential complication in surgical procedures on the lower neck, in the presence of sepsis; or when instrumentation of the œsophagus, trachea and bronchi is carried out.

## ETIOLOGICAL FACTORS

Inhalation anæsthesia, especially ether, has been blamed from time immemorial as the cause of postoperative pneumonia and bronchitis. While it is true that a few cases may be justly attributed to the irritation of anæsthetic, the majority cannot be so explained. There is much evidence to bear this out. Complications follow all types of anæsthesia, local and spinal as well as inhalation. Gottstein and Heule, for instance, reported in a series of laparotomies that more pneumonias followed local than general anæsthesia, though with less

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mortality. It must not be forgotten, however, that oftentimes local anæsthesia is chosen because of the grave condition of the patient or because of evidence of recent respiratory tract infection; either one possibly being the factor responsible for the pneumonia. Further evidence that ether is not always responsible for respiratory tract complications is found in the circumstance that many cases in which ether is taken badly, where there is much mucus, dyspnœa and cyanosis involving an obstructed airway to the lungs, do not develop any trouble, and, conversely, the complications sometimes follow technically perfect anæsthesia. This, however, does not lessen the responsibility of the anæsthetist, or the desirability of a smooth anæsthesia free from cyanosis, vomiting and mucus. Aspiration of throat contents, *i.e.*, mucus and food mixed with pathogenic bacteria such as the pneumococcus and streptococcus, undoubtedly at times is a contributory factor. On the other hand, if aspiration alone were of great moment, I am sure that more pneumonia and lung-abscess would follow tonsil operations than are reported, inasmuch as in this type of case there is excellent opportunity for the descent of foreign material into the bronchi.

### TYPE OF OPERATION

How much responsibility attaches to the type of operation and the location of the operative field is a matter of opinion. Statistics show that complications follow abdominal operations more frequently than elsewhere. This may reasonably be accounted for by the diminished aeration of the lung and the inability of the patient to cough out mucus freely, following, or owing to, the limitation of diaphragmatic excursion due to the trauma of rough retraction, or the application of tight binders and dressings, or abdominal distension, or the pain which results from incisions close to the ribs.

Sepsis is also a very important predisposing factor and acts either by impairing the patient's power of resistance or affording a focus from which infection may travel to the lungs by the blood stream or the lymphatics, presumably as septic emboli. This does happen particularly in septic conditions in the upper abdomen, where there is a possibility of direct extension from the subphrenic viscera and peritoneum. The anatomical channels of communication by the lymphatics and venous system are well established. The lymphatic vessels from the mesentery, liver and stomach pass directly through the diaphragm to the anterior and posterior mediastinal nodes and thence into the bronchial lymph nodes, or they pass into the thoracic duct and ultimately in this way drain into the lungs. Then the mesenteric veins which are tributary to the portal system anastomose freely with the gastric, œsophageal, retroperitoneal, and hæmorrhoidal veins, and in this way afford a certain though indirect portal of entry to the lungs. However, bacteriological, pathological, and clinical findings lead us to believe that embolism is an infrequent factor. Whipple and Cleveland found that the pneumococcus was responsible for the majority of postoperative pneumonias, and, inasmuch as the respiratory tract is the habitat of the pneumococcus and not the abdominal cavity, the large number of pneumococcus cases occurring in abdominal operations cannot be explained on the basis of septic embolism. We could account for streptococcal pneumonia in this way, but why should we not have, as we do not, a large number of colon bacillus infections of the lungs, since this is the predominant organism in abdominal sepsis? Blake and Cecil, in experimental work with monkeys, in which animals pneumonia develops and runs a clinical course comparable in every way to the human type, found that the trachea and bronchi are the portals of entry for the bacterial invasion of the lung, whether by the pneumococcus, streptococcus or influenza bacillus. From the trachea the organisms proceed by the lymphatics to the bronchial lymph-nodes at the hilum of the lung, and thence by the lymphatics about the vessels and bronchi to the interstitial tissue, beginning at the hilum and extending to the periphery of the lung. The alveoli are involved secondarily.

A review of the foregoing statements would lead to the conclusion that there is essentially no predisposing cause for the postoperative pulmonary complications. It is felt that we have to do with that indefinable, intangible thing which we term "the patient's vitality or power of resistance," and it is our duty as surgeons and anæsthetists to be more on the alert, especially with precautionary measures.

### BEFORE OPERATION

A careful examination with special reference to the respiratory tract should be made. An infection recently subsiding or subacute, such as a coryza or laryngitis, can and does cause further complications after operation. Certainly no

person thus affected should be operated upon unless in extreme emergency. Patients should be kept in bed the day before operation, if possible, with sufficient blankets on the bed, and suitable warm clothing, avoiding draughts at all times, and subjected to careful oral hygiene.

### Choice of Anæsthetic

Meet the choice of surgeon and patient in so far as it will not interfere with your own judgment. But do not attempt to adjust a patient to a given anæsthetic. The anæsthetic must be adjusted to the patient.

### During Operation

Further precautions against draughts and chilling of the patient by the use of cold solutions should be taken. The operating room should be warm, avoiding all unnecessary delays during operation. The patient should not leave the operating room without a dry warm nightgown and properly warmed blankets.

The surgical technique includes the ensurance of careful asepsis, perfect hæmostasis, avoidance of undue traumatism of tissue. The dressings, especially those over the upper abdomen, should be applied snugly, but not so firmly as to restrict the respiratory movements.

### After Operation

Further protection against exposure should be made. Free movement in bed is to be encouraged, with elevation of the head and thorax from the flat position, especially where there is a tendency to hypostasis of the lungs.

If pneumonia or other pulmonary complications develop, the principles of the treatment of non-surgical pneumonia and lesions should hold sway. Those essential are good nursing, plenty of fresh air, forcing of the fluid intake, especially water, enough digitalis or caffeine to support the heart, and enough sedative to relieve anxiety and pain.

Reviewing the histories of some sixteen hundred cases operated on at Grace Hospital in 1927, postoperative pulmonary complications were found in eleven cases. Briefly these cases were:—

### Summary of Cases

1. A man, aged 59 years: herniotomy; congestion of the base of the lungs after seven days; normal three days later.

2. A man, aged 40 years: hæmorrhoidectomy; dry pleurisy ten days after operation; recovery.

3. A girl, aged 14 years: appendicectomy; congestion of the base of both lungs after three days; normal two days later.

4. A man, aged 22 years: submucous resection; some congestion of lungs next day; normal in three days.

5. A woman, aged 25 years: appendicectomy; dry pleurisy eleven days later; normal in five days.

6. A man, aged 65 years: herniotomy; strangulated hernia; death from pneumonia and myocarditis four days later.

7. A woman, aged 38 years: currettage; incomplete abortion; a septic case with phlebitis of both legs; two blood transfusions; ninth day, pleural effusion; culture, negative; died from septicæmia five weeks after admission to hospital.

8. A man, aged 20 years: mastoiditis; sinus thrombosis and peri-sinus abscess; death from influenzal pneumonia in three weeks.

9. A woman, aged 30 years: appendicectomy; right lobar pneumonia two days after operation; death two days later.

10. A woman, aged 65 years: plaster spica for fracture of femur; death from pleuro-pneumonia eleven days later.

11. A woman, aged 80 years: plaster spica for fracture of the neck of the femur; broncho-pneumonia; cured.

The last three cases were anæsthetized with nitrous oxide and oxygen. The other eight received nitrous oxide, ethyl chloride, and chloroform with ether sequence.

### References

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2. Cleveland, M., *Surg. Gynec. & Obst.*, 1919, xxviii, 282.
3. Blake and Cecil, *J. Exper. M.*, 1920, xxxi, 403, 445, 499, 519 and 657; 1920, xxxii, 1, 401, 691 and 710

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"We have a great responsibility in functional nerve diseases, and in functional conditions which complicate convalescence from an accident, and this is a great deal more than we, as a rule, realize. We can, by supineness, make chronic invalids, or we may, by throwing the weight of our personality into these cases, restore them to work, and teach the working classes that there is much more happiness in work than in idleness. Many working men have not yet learned that the only true happiness lies in work. It is wellnigh impossible in accident cases to instil a healthy mental attitude into a man after his case has been set down for arbitration at a county court. Indeed, as a rule, nothing can be done in this direction for a man who has consulted a solicitor."—*The Practitioner*, May, 1928.

# ELECTRO-THERAPY IN GENERAL PRACTICE

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THIS paper is a short report on clinical observations and results in a series of 115 cases of various diseases met in the ordinary run of general practice, in which it was thought that physical therapy, with or without other agents, would produce better, quicker and more lasting results. Where other measures besides physical therapy were used they are mentioned.

In the application and evaluation of any new form of therapy one is apt to be influenced by two general and fundamental sentiments, one or other of which is to be found in every individual, *viz.*, over-enthusiasm or the reverse; and usually results, as published, depend on which one of these sentiments holds sway in the individual making the observations and correlating the results. To obviate this probable source of error, these cases have been submitted to an independent colleague for confirmatory diagnosis, and for observation of the progress and results. So as not to take up too much space, details of general technique have not been gone into. In cases where a brief mention of some points in technique would clarify matters this has been made.

As a sufficient number of cases of the various diseases mentioned below have not been treated to warrant a definite opinion on the value of this form of therapy, the idea prompting this paper is merely to stimulate interest in this addition to the physician's armamentarium, so that its true value may eventually be measured, not from the mouths of high-pressure salesmen, but in terms of clinical experience.

The equipment used consisted of a medical and surgical diathermy apparatus and a quartz mercury-vapour (air-cooled) lamp. Briefly, the general technique, as regards ultra-violet rays, was as follows:—

All patient were divided into two classes for the purposes of dosage: (1) blondes: all with blue eyes, irrespective of the colour of the skin. (2) brunettes: all others. All patients were weighed and a general examination given before beginning the treatments. The distance of the patient from the lamp (burner) was kept constant (thirty inches), except in rare circumstances, but the time was varied.

In all dermatological cases, excepting those in which external causes could be definitely established, it was assumed that the skin condition was but the local manifestation of a generalized disease, affecting the organism as a whole. For that reason, attention was given, not only to the local lesion, but to the whole organism, in regard to foci of infection, diet, elimination, etc. For example, in acne vulgaris the comedones were expressed, and, after the removal of all grease and dirt, the sites were irradiated and then the body was irradiated as a whole. Advice was given as to diet and elimination, as well as treatment for any attendant anæmia.

During the period under review (three months), the following were treated, taking the diseases in alphabetical order:—

## ACNE VULGARIS

Four cases. The disease in all cases was confined to the usual location—face, front and back of the chest. These received a total of twenty-six treatments, an overage of six and one-half per case. No drug was used locally, and in only one case was it thought necessary to give iron for the accompanying anæmia, in the form of Blaud's pills. All the cases cleared up thoroughly to our own satisfaction and to that of the patients.

## ALOPECIA AREATA

There was one case of this condition, in a young man of nineteen years of age, who had about twelve patches varying in size from a ten cent piece to a silver dollar on various parts of the head. The head was shaved as closely as possible, and the ultra-violet ray was applied by means of the air-cooled lamp, at twelve to fifteen inches from the scalp, so as to produce a first degree plus erythema. After five treatments new hair could be detected growing in these bald spots.

### ARTHRITIS

The cases were divided into two general classes, *viz.*, traumatic and non-traumatic. Eight traumatic and nine non-traumatic cases were treated; the non-traumatic being considered rheumatic, gonorrhœal, or otherwise. Of the traumatic cases an average of five treatments (diathermy) were sufficient to give freedom from pain, and to restore the joint to normal. Most of the traumatic cases were sprained ankles. Besides receiving diathermy, all cases were strapped with adhesive plaster. There was no loss of time from their occupations, even in the very severe cases. Of the nine non-traumatic cases four were distinctly gonorrhœal, and yielded to an average of ten treatments by diathermy to the joint and to the urethra; and in the female to the cervix and urethra. The rheumatic cases, as a rule, required a greater number of treatments, averaging about fifteen per case.

### ASTHMA

One case. This received twelve treatments with ultra-violet rays, together with calcium by the mouth, resulting in a complete cessation of spasm, disappearance of the cough, and a gain in weight and appetite. Incidentally, this case had general psoriasis as well, and, to our surprise, on completion of the treatment for asthma, his psoriasis had cleared up completely.

### BRONCHIECTASIS

One case was treated during the afebrile periods with ultra-violet rays (general body raying), for its general effects. After seventeen treatments there was noted a feeling of well-being, an increase in appetite, increase in weight of two pounds, but as other measures, *e.g.*, postural drainage and tonics, were used simultaneously, it is difficult to say what proportion of good, if any, was due to the ultra-violet ray.

### CANCER

One case of carcinoma of the lip was treated, in a man of eighty-two years, which had recurred after removal by a so-called "cancer doctor" some years before. The growth was coagulated *in situ* and allowed to slough, which event occurred in ten days; in three weeks from the date of treatment the area was completely healed, leaving a soft pliable scar. By this bloodless method, it was felt that any chance of metastasis was lessened or prevented altogether. Besides, the operation was an office procedure. A local anæsthetic was used.

### ECZEMA

Eight cases of eczema of various parts of the body were treated. They ranged, in regard to the clinical picture, from the weeping to the dry scaly form. The severe cases (5) received a total of one hundred and ten treatments in the form of local ultra-violet ray treatments and general body raying. In dealing with this series the lesson was impressed that the ultra-violet ray is capable of doing harm, and should only be administered by or under the supervision of a physician experienced in the use of such agents. This was a case of eczema of the chin of the sub-acute form. The patient, in question, was getting along nicely on regular distance application, but it was thought that the lesion was not disappearing fast enough, so when the patch was reduced to the size of a five-cent piece we doubled the time and shortened the distance by one-quarter, protecting, of course, the adjacent normal tissue. To our surprise, the day after, his eczema was worse than it ever was and was itching and weeping. The treatments were stopped, and, after about a week, the superimposed acute condition disappeared, and slow and minimum raying brought the case to a successful conclusion. In one very bad example of eczema of the hand the lesion cleared up nicely, but recurred two weeks after cessation of the treatments. All eczema cases received calcium in some form, on the strength of the repeatedly demonstrated fact that there is often a lowered blood calcium content in these cases.

The lesson learned in these cases was that the acute and sub-acute forms were more amenable to treatment (at least by the air-cooled lamp); and that the dry scaly forms had to be rayed very heavily to produce a third degree erythema and that all scales had to be removed before success could be achieved. All the cases cleared up completely, excepting one.

### EPIDIDYMITIS

One case was treated by diathermy and, was completely relieved after six treatments. The patient was not confined to bed and wore a suspensory bandage. The treatments were

given daily, and after six the swelling subsided, and patient was able to work.

### FURUNCULOSIS

Four cases of this condition were treated by local and general body raying. One case, after twelve treatments, showed some improvement, but it was not a complete success. This was a case referred to us in which everything else had been tried for repeated boils in the nose. A thorough examination failed to reveal any underlying condition. Complete success was probably due to lack of the proper apparatus. A water-cooled lamp, with quartz applicator, would have produced more gratifying results.

One patient who had been afflicted with boils continuously for the past three years, has not had any for the past three months, after five treatments, the longest period of relief in three years.

### GENERAL RUN-DOWN CONDITION

Six such cases were dealt with, in women of the large-family and hard household-workers type, who presented no special lesions, but complained of lassitude, headache, and a feeling of being "all in." These cases were given ultra-violet ray, (general body raying). They all showed, after an average of ten treatments, increase in weight and appetite, and a feeling of well-being. The feeling of well-being may, of course, be psychological, but the increase in weight and appetite must be credited to the ultra-violet ray.

### CHRONIC GONORRHŒA

During the period twelve cases of chronic gonorrhœa in male and female, of six months to three years standing, were treated. They all had diathermy to the urethra, prostate, vagina and cervix, as the case might be. All showed, after the first two or three treatments, increase of discharge which then became gradually less, until there was complete cessation, the male missing even his "morning drop." It was found also that the urethra or cervix could be treated up to 108° F. in most patients without discomfort. All were discharged cured, after showing three negative smears from the urethra or cervix.

### HÆMORRHOIDS

Two cases of external, and one of internal, hæmorrhoids were treated by electro-coagulation with the Bierman clamp. The technique followed was that of Dr. Wyeth, of New York. The first case had no occasion to lie up. The second, owing to an associated prolapse of the rectum, had to lie up for one week. The third, of internal associated with external hæmorrhoids, had no discomfort, and was able to work next day. We are convinced that this will be the standard method for the removal of hæmorrhoids in time, as it entails simplicity, no loss of time, no pain, very little if any reaction, and less expense. Two per cent novocain was the anæsthetic used in these cases.

### HIGH BLOOD PRESSURE

One case of essential hypertension was treated, in a man of forty-six years of age, in whom the systolic blood pressure was 220, and diastolic 120. The systolic was reduced to 180 and the diastolic to 110, after treatments by auto-condensation. There was however a gradual return to 220/120 six weeks after the treatment had been stopped. The mode of living, diet, and elimination played no part in the case, during or after treatment, as the same regimen was followed as closely as possible during and after treatment as before it was started. The effect on blood pressure was transitory so far as can be judged from this one case.

### IMPOTENCE

Three cases of impotence in young men, twenty-six to forty-five years of age, were given ultra-violet ray and diathermy, in the form of sharp sparks over the lumbar vertebræ, with the Oudin current, after drugs had been given a fair trial. They had an average of ten treatments each with the result that all three cases showed marked improvement after six treatments.

### LUMBAGO

Two cases of this condition were treated by diathermy. In both cases improvement was noticed immediately after the first treatment, and this improvement continued until the pain completely cleared up. The two cases had twenty-two treatments, an average of eleven per case.

### MOLES

Two cases of moles of the back of the neck were treated by desiccation with the Oudin (monopolar) current. No anæsthetic was used and one application was sufficient.

### MUCOUS COLITIS

(*Associated with Neurasthenia*)

This was a case that had been the rounds of various doctors. He had had his appendix removed for some vague pain in the abdomen. His case was diagnosed as neurasthenia associated with mucous colitis. He was given colonic lavage (Battle Creek method), and ultra-violet ray and diathermy to the colon by means of electrodes to back and abdomen. After eighteen treatments he was restored to health, gained in weight and appetite, and went back to work.

### NEURALGIA

Three cases of neuralgia of the ophthalmic division of the fifth nerve were treated. In one, the worst, both ultra-violet ray and diathermy were applied and marked improvement was obtained after twelve treatments. Previously this patient had been taking about sixty grains of aspirin every twenty-four hours for about two months to obtain relief. No drugs were given with treatment. The other two cases had diathermy only with complete relief.

### NEUROSIS (*Climacteric*)

The three cases treated had the usual nervous symptoms associated with the menopause. General body baths, with ultra-violet ray were given in all cases and also calcium. The three cases had a total of forty-five ultra-violet ray treatments, and showed improvement in their mental state, gained in weight and had a brightened outlook on life.

### NEURASTHENIA

Under this head were placed all cases in which there was a multiplicity of symptoms, but no lesion to be found. Six such cases had a total of eighty treatments with ultra-violet ray, with the addition of diathermy when necessary for pain. All the cases, except one, were restored to normal health, with a feeling of well-being, gain in weight and appetite, and cure of insomnia. All the cases received phosphorus and calcium in some form, in addition to the treatments. One case, with an associated cryptic tonsil, improved at first, but later relapsed. Subsequent removal of the tonsil and further treatment did not seem to help matters. This case had more than thirty treatments.

### NEURITIS

This was a case of neuritis of the right arm in a woman about fifty, who had suffered from this condition for about one year, causing a great deal of insomnia, so that she had to be given narcotics. After fifteen treatments with mild diathermy and auto-condensation her neuritis disappeared, and she is now free from all symptoms and sleeps well.

### NÆVUS

There was one case in a child of three years, with the usual port-wine colour extending over the forehead to the eyebrow and down to the cheek bones on the right side, with hair covering the area. This area was desiccated with the monopolar current, and the area destroyed, leaving a scar which in time we hope will scarcely be noticeable. The result here was very satisfactory indeed.

### PARONYCHIA

One case was treated by means of the ultra-violet ray with complete success.

### PLEURISY

During this period three cases of pleuritis sicca, which had a total of twenty-two treatments by diathermy to the affected part were completely relieved.

### POST-FRACTURE CONDITIONS

Two cases of post-fracture conditions, *e.g.*, stasis around the joint, restricted movements, swelling and pain, were treated by diathermy and massage. Both cases showed rapid diminution of these signs after an average of five treatments.

### POST-OPERATIVE PELVIC ADHESIONS

One case, which had been operated on for "appendicitis" and "ovarian trouble" some years before. She still complained of pelvic pain; and was subsequently operated on twice for pelvic adhesions, with no relief. On examination, no pathological condition could be found, and the patient was against further

exploration. Diathermy was advised, in the hope that relief might be obtained. After ten treatments, by means of diathermy through the vagina and lower abdomen, the patient was completely relieved.

### PNEUMONIA (*Lobar*)

One case. This was a case of very virulent pneumonia, infection involving both lungs, with greenish red expectoration, etc. After the usual treatment by means of topical applications and medicines, the patient continued to go down hill, Cheyne-Stokes respiration being present, the pulse becoming weaker and intermittent, and the patient becoming very cyanotic and delirious. Diathermy was tried as a last resort; one thousand milliampères were given for forty-five minutes to the chest anteriorly and posteriorly by means of two electrodes. Fifteen minutes after the application the patient complained of being very warm, perspired freely, and the cyanosis disappeared, the cheeks becoming quite red. At first there was a slight increase in the pulse rate, from 140 to 150 per minute, but it became more regular and the quality was better. The Cheyne-Stokes feature of the respiration disappeared also. Treatment was then discontinued, but in one hour the danger signals of Cheyne-Stokes respiration, etc., returned. The patient was then given another forty-five minutes treatment, but the response was not so good as at the first application. Patient eventually died five hours after the last treatment.

### PSORIASIS

Of two cases of this disease, one was spontaneously cured during treatment for asthma, as mentioned before, after twelve treatments by ultra-violet ray. The other, a case of general psoriasis in a young man of eighteen years of age, completely cleared up after eight treatments by the ultra-violet ray. Both had calcium in some form.

### PRURITUS VULVÆ

One case of this distressing condition in a married woman was treated by means of the ultra-violet ray. The first few treatments were sufficient to allay the itching, and after eleven more the condition was completely relieved.

### RICKETS

There were two cases of rickets in children, eighteen months and two years old, respectively.

One, a coloured child, could not sit straight and had no desire to get up or play. Soon after the third treatment with the ultra-violet ray the child became brighter and made attempts to stand up. He was generally keener, enjoyed his meals better, and gained in weight. An associated bronchitis also improved with no other treatment. This child had five treatments but was forced to discontinue owing to the illness of his mother, but the improvement was most marked.

The other, a girl (white), had only one treatment, so that the effect cannot be appreciated.

### SARCOMA

One case of sarcoma of the middle turbinate, in a woman fifty years of age, was treated by electro-coagulation. In this case, which had been going on for six months, the growth had completely blocked the right naris. The portion blocking the naris was destroyed, so as to permit investigation of the posterior nares. The operation was bloodless, and after about two weeks it was found that the antrum and hard palate were involved. Under a general anæsthetic as much of this as possible was destroyed, and though a cure is not possible the growth has certainly been retarded and the patient saved from being exsanguinated from the many and frequent hæmorrhages she had been having.

This was a growth that no surgeon, however expert, would have attempted to remove, as the operation would have been mutilating at best, and metastases would most likely be formed from the carrying of malignant cells by the blood. The procedure was bloodless, and accordingly, there was no danger of metastasis resulting from the operation.

### SCIATICA

Of four cases of this condition treated, two were completely relieved after a total of twenty treatments by diathermy; one was partly relieved, and one obtained no relief. It is only fair to mention that the case that was not relieved had a mild pyorrhœa, for which removal of the teeth was advised, but the advice was not acted upon.

### SPERMATORRHŒA

One case of this condition was treated by diathermy to the prostate and testicle. After ten treatments there was a much diminished "loss," but the condition was not completely cured. This patient also had calcium and phosphorus.

### VARICOSE ULCER

Four cases of this condition, varying from single small superficial ulcers to many deep craters in each case, were treated. The four cases received an average of ten treatments each with the ultra-violet ray. No case was confined to bed with elevation of the limb. A supporting crepe bandage was however used in all cases, and all had calcium in some form. No topical application was used, excepting the painting with 2 per cent mercurochrome before each exposure. In all cases it was noticed that the terrible itching ceased after the first treatment, and the pain was relieved, or disappeared completely, after the second or third treatment. Any associated eczema in the region of the ulcers cleared up completely. An elastic stocking, following the healing of the ulcers was advised in all cases.

### WARTS (*Common and Venereal*)

Eight cases of warts of various parts of the body were treated by desiccation with the Oudin current. One application was sufficient in all, and in only one case, of the venereal type, involving the entire corona, was it necessary to use a local anæsthetic. In our opinion it offers an easy and quick method of removing these annoying things, far superior and safer than the old way, with applications of caustics such as nitric acid.

### CONCLUSION

Following our limited experience with this form of therapy we are of the opinion that it offers many advantages over other forms of therapy in the treatment of many conditions that come within the purview of the general practitioner; but there are two essentials, apart from good equipment and technique, namely, perseverance on the part of the patient and stick-to-it-iveness on the part of the doctor.

I take this opportunity of expressing my grateful thanks to Dr. W. J. Egan for valuable and helpful advice during the period under review, and to Miss Bessie McNeil, R.N., who assisted in carrying out the treatments.

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## PNEUMOCOCCIC MENINGITIS*

BY W. R. KENNEDY, B.Sc., M.D., C.M.,

*Montreal*

A RECENT series of cases of pneumococcic meningitis admitted to the medical service of Dr. A. H. Gordon and Dr. C. A. Peters in the Montreal General Hospital forms the basis of this paper.

Whether one can classify such cases into primary and secondary groups is debatable. Just as one speaks of primary pneumococcic peritonitis, so there are cases which must be called primary meningitis of pneumococcal origin. The larger group, however, is made up of cases that are secondary to pneumococcal infection elsewhere. They can be arranged as follows: (a) Cases with original foci of infection, acute or chronic, in paranasal sinuses, middle ear, and mastoid areas; (b) Cases following fracture of the base of the skull, especially those that open a path of infection through the sinuses, middle ear, or pharynx; (c) Cases in which there is a preceding blood-stream infection. This last group is again subdivided into primary and secondary septicæmias, the latter being best exemplified by the septicæmia that complicates a lobar pneumonia. This is in accord with Baldwin and Cecil's conclusion that, just as the commoner pyogenic infections are usually localized but at any time may progress to the septicæmic stage, so may pneumonia lead to pneumococcic septicæmia.

The prognosis of pneumococcic meningitis is exceptionally grave. Kolmer reports a mortality of 100 per cent in 14 cases of various types.

*Read at a meeting of the Montreal Medico-Chirurgical Society, March 30, 1928.

Schottmüller records a similar issue in 100 cases. Cole has observed 8 cases of meningitis secondary to pneumonia out of a total number of 770 cases, and all were fatal. It is not, however, uniformly fatal, for authentic instances of recovery are found scattered throughout the literature. Jemma in 1896 reported the first such case, and more recent recoveries are quoted by Cumming, Campbell, Ratnoff and Litvik, Simpson, Synge, Douthwaite, Harkavy, Globus and Kasanin. Cecil and Baldwin point out that the presence of infection in the blood is an important determining influence on prognosis in a pneumonic infection. They found that the total mortality rate for thirty-seven patients with pneumococcus pneumonia with positive blood cultures was 78.3 per cent, in contrast with a death rate of 10 per cent in seventy cases with sterile blood cultures.

The therapeutic procedures followed in cases of pneumococcic meningitis with recovery have been: (1) Intrathecal serum therapy, as in the case reported by Simpson; (2) Repeated lumbar and cisterna magna punctures, alone or combined, as recorded by Globus and Kasanin, and Synge; Rolly also reports a case of pneumococcic meningitis coexistent with pneumonia in a child in whom sixteen lumbar punctures were performed and 600 c.c. of spinal fluid withdrawn, with a favourable outcome; (3) Laminectomy for continuous drainage, as suggested by Hill and Rainey and Alford; (4) The injection of Morgenroth's optochin hydrochloride by the method of Ratnoff and Litvak; spontaneous recovery has been recorded by Parkinson.

The following case reports represent various types of pneumococcic meningitis.

### CASE 1

Male, aged 15 years, admitted January 13, 1928.

*Complaints.*—Vomiting, convulsions, unconsciousness.

*Family history.*—Irrevelant.

*Personal history.*—The patient had been admitted to the Montreal General Hospital on December 20th, subsequent to a head injury, and was discharged on January 3rd, in good health, with a diagnosis of contusion and concussion, and an x-ray finding of fracture of the base of the skull in the right frontal and ethmoidal regions.

*Present illness.*—He was apparently well until the night of January 12th. That night and the following day he vomited on several occasions, and also complained of right-sided earache. On the next afternoon he had a convulsion and until admission that night had been very restless and semicomatose.

On admission his temperature was 104°; pulse, 116; respirations, 32. He was semi-comatose and was tossing restlessly in bed. The pupils were dilated but active. Neither herpes nor nasal discharge was noted. The right ear-drum was reddened and bulged somewhat. The glands, throat, lungs, heart and abdomen were negative. The blood pressure was 132-78. No cranial nerve lesion was made out. The extremities showed free movements; abdominal reflexes and knee-jerks were absent. Bilateral Kernig sign and rigidity of the neck were present. The urine was negative. The white blood cells numbered 24,000 per c.mm. Lumbar puncture, under anæsthesia, revealed a turbid fluid, the cell count of which was 19,000 polymorphonuclear cells predominating. Scattered Gram-positive, lancet-shaped diplococci were found in the direct smear. Paracentesis of the right ear was done and only a serous exudate escaped, culture of which yielded *S. aureus*. On culture of the spinal fluid pneumococci were isolated. Mastoid drainage on the right side was performed but only an acute hæmorrhagic condition without pus was found. Death occurred on January 15th after a four days' illness.

The *clinical diagnosis* was pneumococcic meningitis (type IV.); fracture of the base of the skull; right acute otitis media.

*Autopsy findings.*—Meningitis with purulent exudate at the base and spreading to the cortex; linear fracture of the base of the skull, involving the right frontal sinus and extending along the floor of the anterior fossae (this was probably the path of infection). The right frontal, ethmoidal and sphenoidal sinuses contained pus and pneumococci were cultured from it; the right mastoid area presented granulation tissue and some pus, but this was sterile on culture. Pneumococci were isolated from the meningeal exudate.

### CASE 2

Female, aged 66 years, admitted January 6, 1928.

*Complaints.*—Unconsciousness.

*Personal history.*—The daughter stated that her mother had had good health, except for neuralgic pains about the face for the past year. About December 26th, 1927, the patient developed a slight chest cold, and also complained of backache and of sore eyes. She remained in bed from the onset of the illness. For a few days she had a right-sided earache, but this disappeared on January 3rd without discharge of pus. For ten days periods of perspiration had alternated with those of chilly sensations. Nausea appeared on January 5th, with vomiting the following day, and shortly afterwards unconsciousness which persisted till admission.

On admission, the patient was comatose but resisted movements. The pupils were small, inactive and equal. The throat, lungs, heart and abdomen were negative. The blood pressure was 150-80. No cranial nerve lesion was made out. There was movement in all limbs, but she did not respond to questions. The knee-jerks were feeble. There was plantar flexion, also a bilateral Kernig sign and rigidity of the neck. The right ear-drum showed some redness, but there was no tenderness over the sinusus. The urine was negative. The white blood cell count was 12,800 per c.mm. On lumbar puncture, spinal fluid escaped, in which Gram-positive diplococci were found in direct smear and later were isolated in culture as type IV pneumococcus. The otolaryngologist confirmed the redness of the right ear-drum, with loss of lustre and light-reflex, but, as there was no sagging of the posterior wall, he did not consider the mastoid to be a focus of infection. On January 8th the patient developed some feeble clonic spasms in right arm, and also a sanguino-purulent discharge from the right nostril. In view of the history of neuralgic pains in the face, the presumption was that the meningeal infection arose from a paranasal sinusitis. Death occurred on the third day of meningitis.

The *clinical diagnosis* was pneumococcic meningitis, and paranasal sinusitis.

*Autopsy* showed purulent meningitis; sphenoid sinusitis; and right mastoiditis. The mastoid area was less involved than the sphenoid sinus. Pneumococci were recovered from each of the above lesions.

### CASE 3

Male, aged 10 years, admitted March 17, 1928.

*Complaints.*—Headache, vomiting, restlessness, delirium.

*Family* and *personal* histories were irrelevant.

*Present illness.*—On March 16th the patient com-

plained of headache about noontime, and vomited on returning from school in the afternoon. He was put to bed and fever was noted. Vomiting occurred several times that evening and he soon became restless and delirious. These symptoms gradually progressed till he was admitted to hospital on the night of March 17th. No history of accident or earache.

On admission, his temperature was 103°; pulse, 108; respirations, 40. He was delirious and was tossing about in bed, resisting all movements. Photophobia was present; the pupils were equal and active. No herpes. The ears, throat, heart, lungs and abdomen were negative. No cranial nerve involvement or motor paralysis was found. The knee-jerks were absent; plantar reflexes showed no reaction. No clonus. Bilateral Kernig sign and rigidity of the neck were present. Lumbar puncture showed a pressure of 30 mm. of mercury, and 12 c.c. of turbid spinal fluid were removed slowly. The cell count was 500 c.mm., 75 per cent of which were polymorphonuclear cells. Gram-positive lancet-shaped diplococci were found in direct smear, and type IV pneumococcus was reported on culture. One hour after lumbar puncture the patient became suddenly cyanosed and died, after an illness of thirty-eight hours.

*Clinical diagnosis.*—Fulminating pneumococcic meningitis, so-called "idiopathic." No autopsy was allowed.

### CASE 4

Male, aged 50, admitted February 9, 1928.

*Family* and *personal histories.*—Irrelevant.

*Present illness.*—This patient was admitted on the tenth day of illness, with a frank lobar pneumonia. The rest of the physical examination, including the urine, was negative. The white blood cell count was 17,000 per c.mm. Sputum typing showed type IV pneumococcus. The temperature on admission was 101°; pulse, 100; and respirations, 40. The following day the temperature and respirations had fallen to normal. On this day a routine blood culture was taken, and four days later was reported as positive for pneumococcus, but owing to an accident, typing was not done. From the fifteenth to the eighteenth day of illness there was a remittent fever, associated with chills and profuse perspirations. There were no pulmonary signs that could account for this course. On the nineteenth day the patient was somewhat drowsy and listless. An apical systolic murmur was then noted for the first time. The pupils were small and sluggish. Slight left facial weakness and some stiffness of left arm and leg were noted. A left-sided Babinski sign was elicited, as well as a bilateral Kernig sign and rigidity of neck. A blood culture was again made and was reported the following morning as positive for pneumococci. A lumbar puncture was then done and clear fluid escaped, the cell count of which was twenty, and globulin was absent. On culture, no growth was obtained. The next day a complete left-sided hemiplegia was found, with weakness of the right upper extremity. The clinical interpretation of this case was then considered to be a spreading cortical meningitis, as a part of a pneumococcic septicæmia, with an acute mitral endocarditis of the same origin. The possibility of the cerebral features being due to an infected embolus was thought unlikely, on account of the slowness of the onset of symptoms. On February 20th the pneumococcus from the bloodstream was reported as the type I strain. There was gradual extension of the cerebral symptoms, and, with little hope of obtaining any benefit, the patient was given 75 c.c. of type I antipneumococcic serum intravenously. Death occurred on the 21st day of illness.

*Clinical diagnosis.*—Lobar pneumonia; pneumococcic septicæmia (type I.); pneumococcic meningitis: acute mitral endocarditis of pneumococcic origin.

*Autopsy findings.*—Lobar pneumonia, affecting the right upper and middle lobes in resolving stages; endocarditis with recent vegetations on the mitral valve; multiple infarcts in the spleen; purulent meningitis, the exudate covering the right cerebral hemispheres much more extensively than on the left side; from this exudate pneumococci were isolated.

### CASE 5

Male, aged 29 years, admitted on March 3, 1928.

*Complaints.*—Weakness, general malaise, fever, painful left eye.

*Family* and *personal histories.*—Irrelevant.

*Present illness.*—The onset of the present illness dated from February 24th. According to his physician, the course had simulated in many respects that of typhoid fever, as evidenced by his general appearance and the development of a palpable spleen, but the temperature had been intermittent with ranges from normal to 104° daily, and was accompanied by chills and profuse sweats. On March 1st an acute pain developed in the right eye, and since then that eye had become extremely reddened. The patient also complained of severe frontal headache on admission.

On admission, his temperature was 103°; pulse, 118; respirations, 32. He was semi-stuporous and typhoidal in appearance; was able to give part of his history, but had to be continually aroused during the history-taking. The left eye presented an intense degree of panophthalmitis. There was no tenderness over the sinuses, and the ear-drums were intact. X-ray examination of the sinuses was negative. Herpes was not present. The tongue was dry and coated with sordes. The lungs and abdomen were negative, except for a easily palpable spleen. There was a loud apical systolic murmur, which was present when first seen by his physician, but was observed to have increased in intensity during the progress of his illness. Roseola, petechiæ and tender points on finger-tips were absent. Superficial twitchings were noted in the right arm. The cranial nerves were intact. No loss of motor power and no pathological reflexes were found, except for a bilateral Kernig sign and rigidity of the neck. The urine was negative. The white cell count was 19,000 per c.mm. The spinal fluid was turbid, the cells numbering 1,000 per c.c., 80 per cent of which were polymorphonuclear in type. The Pandy and Ross-Jones tests were three plus. Gram-positive diplococci were demonstrated in the direct smear, and type IV pneumococci were cultured. Blood culture was reported as positive for the same organism. Both results were confirmed on subsequent cultures. Towards the end of the course numerous petechiæ appeared on the abdomen and increasing coma developed. The patient was given one blood transfusion and many glucose-saline intravenous injections, and there were repeated lumbar punctures. A total of 400 c.c. of spinal fluid were removed, and as much as 80 c.c. were taken off at one time. Death occurred on the twenty-sixth day of illness and on the tenth day of the meningitis.

*Clinical diagnosis.*—Pneumococcic septicæmia with complicating meningitis; endocarditis; and left panophthalmitis.

*Autopsy findings.*—Basilar meningitis; acute mitral endocarditis; left panophthalmitis; infarction of spleen and kidneys; pneumococci were isolated from the meninges and mitral valve.

### SUMMARY

1. Five cases of pneumococcic meningitis are reported, all of which were fatal.

2. The age incidence varied from ten years to sixty-six.

3. The etiological factors in this series are:—

(a) Fracture of the base of the skull.

(b) Paranasal sinusitis and mastoiditis.

(c) So-called primary cryptogenic meningitis.

(d) A septicæmia following a frank lobar pneumonia.

(e) A primary septicæmia.

4. Duration of meningitis in these cases; minimum, 38 hours; maximum, 10 days.

5. In two cases there was acute endocarditis of pneumococcal origin.

6. One case showed general pneumococcus infection without localization in the lungs.

7. One case of fatal general pneumococcus infection occurred even after almost complete resolution of the primary pneumonic lung.

8. A rare complication of metastatic panophthalmitis.

In conclusion, I wish to thank Dr. A. H. Gordon and Dr. C. A. Peters for their kind permission to report these cases, and also to express my appreciation to Dr. Gordon for his valuable assistance in the preparation of this paper.

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## ECZEMA*

BY HAROLD ORR, O.B.E., M.B., D.P.H.,

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IN any discussion on eczema it is first of all necessary to define exactly what type of superficial catarrh of the skin one has in mind. Defined by Willan (quoted by his pupil, Bateman) eczema consists of a circumscribed patch of closely set, pin-head sized, deeply formed vesicles, accompanied by itching and burning. At first there is very little inflammation at the bases of the vesicles, but this phase is of short duration, and in the fully developed patch there is redness and swelling.

A study of sections cut from such a patch at various stages of its evolution shows that the earliest change is a dilatation of the superficial capillaries, with a pouring out of lymph from these vessels into the intercellular spaces of the epidermis. This causes spongiosis or œdema, and as the pressure increases the intercellular fibrils break, the cells are pushed aside, and a sterile vesicle is formed in the middle of the prickle-cell layer. This enlarges to the size of a pin-head and may rupture on to the surface (weeping eczema). The process may at any time be checked, lymph being poured out of the capillaries in amounts insufficient to cause weeping on the surface and giving rise merely to œdema. This causes an increase in the rate of multiplication of the cells of the stratum germinativum, and may even cause mitosis in the prickle-cell layer, leading to thickening (acanthosis) and to a derangement of the process of keratinization (parakeratosis) which results in the formation of scales.

There is another type of inflammation of the skin resulting from a specific irritant, such as hair-dye or a plant. In this the inflammation is more diffuse and the vesicles more superficial, not all of one size, and frequently coalescing to form bullæ. The trouble subsides so soon as the irritant is removed and only recurs on the exhibition of the specific irritant. This condition is labelled dermatitis. Etiologically, it differs from eczema in its specificity. There is an idiosyncrasy on the part of the individual. I have two patients, dentists, with an idiosyncrasy for novocain, in whom this drug always produces a dermatitis when it comes in contact with the skin, yet neither has ever had an inflammation of the skin from any other cause. This idiosyncrasy may be acquired or inborn. As an example of the acquired type, there is the photographer, who after many years in his profession may suddenly develop an idiosyncrasy for metol or hydroquinon and thereafter a dermatitis de

* Read at the annual meeting of the Canadian Medical Association, Toronto, June, 1927.

velopes on every contact with the irritant. The natural idiosyncrasy for *Rhus toxicodendron* is inborn and so common as to be a racial characteristic.

In eczema there is no specificity. This type of patient has a susceptible skin which reacts in a definite way to any irritant; even scratching or rubbing being sufficient in most cases to produce the reaction. It must be admitted, however, that there are cases of occupational dermatitis clinically and histologically indistinguishable from eczema, and one may have to rely on the history. From eczema should be excluded, of course, such conditions as seborrhœic dermatitis, due to Unna's bottle bacillus; and ringworm of the extremities, due to an epidermophyton. These eruptions may closely simulate eczema, but belong to a different category.

The constitutional factor in the causation of eczema has been much dilated upon by many writers, and there are few chronic ailments which have escaped notice in this connection. Usually, they are referred to in general terms, such as: "Disturbances of the Nervous System", "Any systemic derangement affecting nutrition or excretion", "Foci of infection", and so on with little or no evidence to prove that any one of them is capable of producing eczema *per se*.

All will probably agree that some internal factor or factors are concerned in most cases. The perplexing feature is the fact that so many diverse internal causes are apparently capable of producing the eczematous reaction, or at least of causing in the skin a susceptibility to this type of reaction under the stimulus of external irritation. Probably this susceptibility is brought about by an anatomical change in the skin itself, and this opinion is based on the observation that xeroderma, or dry skin, is associated with the great majority of cases of eczema coming under observation. In the prairie provinces of Canada the relative humidity of the atmosphere is low and any tendency to dry skin is accentuated. It is not unusual for a patient who has been afflicted with eczema in the east to find, on taking up residence in the west, that the skin becomes noticeably dry, a feature not previously observed. People with normal skins are not troubled in this way in the west. It may be suggested that in the case of these persons the skin has perhaps always been deficient insofar as the sebaceous glands are concerned, but in a very minor degree. Now, precise information regarding the influence of the other systems of the body over the sebaceous glands is lacking, but it is believed, as pointed out by Reade,[1] that the vegetative nervous system is an important factor. This system consists of two parts, the sympathetic and the parasympathetic. A balance between the two produces physiological poise, or a co-ordination of metabolic activities, which is the normal state. It is believed that this is accomplished through the hormones of the ductless glands, which are under the control of the vegetative nervous system and influence various elements of the skin, such as, the pigment, sweat-glands, sebaceous glands, hair and nails, and vasomotor tone. Dysfunction of this neuro-endocrinological mechanism arises in response to three varieties of stimuli: (1) metabolic; (2) toxic; and (3) psychic. It can thus be understood how it is possible for an element of the skin to be influenced in a particular way by a variety of primary causes, and it is suggested that the eczematous patient has a skin deficient in sebaceous gland function, and that this condition is brought about by dysfunction of the endocrinological system. There is here a fertile field for investigation, and, as our knowledge of endocrinology increases, no doubt our present day conceptions, or misconceptions, of many dermatoses will be materially changed.

In the treatment of eczema, if there is weeping, it is useful to begin with the dilute liquor plumbi subacetatis, a few layers of gauze being laid on and kept saturated. In twenty-four to forty-eight hours White's crude coal tar ointment may be applied, a thick layer being plastered on and covered with a few layers of gauze. This should be renewed once daily, and it is well to avoid irritating the skin by attempting to remove all of the old ointment. At the end of from four to seven days the skin will probably be clear, and the ointment may be removed gently with olive oil. X-rays are very useful in the chronic scaly variety. Ultra-violet light should never be used in the treatment of acute eczema. It is useful as an adjunct, however, in the treatment of chronic dermatitis. Bearing in mind the anatomical abnormality of the skin, if a recurrence is to be prevented, it is necessary to overcome the dryness

of the skin, and for this purpose an ointment of 50 per cent lanolin and 50 per cent vaseline, with the addition of a little calamine, should be applied to the skin twice daily and always after washing. Irritation, especially scratching, must be avoided and special precautions must be taken at night, because most of the damage is done when the patient is dozing off to sleep or before he is completely awakened.

### CONCLUSIONS

1. Eczema is a type of skin reaction occurring in an abnormal skin as a result of irritation.

2. This abnormality may be produced by a variety of internal causes, acting probably through the parasympathetic system.

3. After the outbreak has been cured relapses may be largely prevented by the application of emollients, in an effort to overcome the abnormal dryness.

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## Case Reports

### FOREIGN BODY IN THE KNEE JOINT (JOINT MOUSE)

By A. T. BAZIN, M.D.,

*Montreal*

A man, aged 58 years, was admitted to the Montreal General Hospital complaining of a certain intermitting disability of his left knee. About seven or eight years before he "strained" the knee by slipping whilst lifting a heavy weight. The knee was tender for several weeks but he had no recollection of its being swollen. One year later he discovered an unusual lump above the patella. This lump he could move about with his fingers. No further trouble ensued until two years ago when he noticed that the joint did not always function properly: there was a tendency to hyperextension. For the past six months there had been difficulty in walking up and down stairs; frequently, in acute flexion of the knee there would be locking of the joint which would only be released by manipulating this "lump" beneath the upper edge of the patella. There had never been more pain than an occasional twinge.

Examination revealed nothing unusual in or about the knee joint, except the presence of a mobile mass in the suprapatellar pouch. This mass was not tender and could be turned up on edge and slipped about to the limits of the upper portion of the synovial sac.

On February 9, 1928, under local anæsthesia, the joint was opened and the "joint mouse" removed. The inner surface of the synovial membrane was shaggy and roughened. No other foreign bodies were discovered. The wound was carefully closed in layers.


FIG. 1.—Foreign body in knee joint.

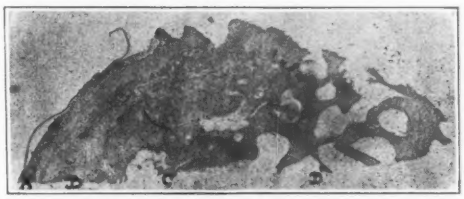


FIG. 2.—Section of joint mouse. (A) Surface with synovial layer partly lifted. (B) Laminated solid layer. (C) Cartilage. (D) Bone.

As will be seen in the accompanying photograph this foreign body is 5.5 x 3 cm. in size, and has a central portion, smooth on both surfaces, surrounded by a margin of irregularly nodular masses. The colour of the fresh specimen was a dense pearly white, the central portion being polished and shining like articular cartilage. The photograph of the section is sufficiently explained by the legend

## AN UNUSUAL TYPE OF SUPERNUMERARY DIGIT

BY S. H. CORRIGAN, M.D., C.M.,

*Lampman, Sask.*

Cases of supernumerary digits of ordinary types are frequently observed. Of the type I present I can find no record. A well known teacher of anatomy in London, after examining the photograph, stated that he had not seen nor heard of such a case as this.

The child (No 179, Lampman Union Hospital, 1926), in all other respects normal, was born of Canadian parents. Both families disclaimed a history of abnormal structures, but I have learned that a child of the father's brother has a supernumerary digit.

The illustration, from a photograph when the child was three months old, shows the pedicle growing from the external lateral aspect of the proximal phalanx of the little finger.

Good tactile sensation was demonstrated over all parts of the structure. The pedicle was entirely flaccid, and could be considerably rotated or elongated by traction, without disturbing the circulation. Amputation was performed when the child, four months old, was brought to the hospital with the entire structure deeply cyanosed.

The terminal portion contained a well developed cartilaginous phalanx. A section of the pedicle showed one main artery and vein.

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## GIANT-CELLED TUMOUR OF THE NECK OF THE FEMUR: OPERATION WITH PROBABLE CURE*

BY W. G. TURNER, M.D.,

*Royal Victoria Hospital, Montreal*

A decided advance in classification was made when the word "sarcoma" was dropped from the nomenclature of this class of tumour. Still, it must be seriously recognized that there is progressive local destruction of bone as the growth advances. It is necessary to keep this in mind if we are to improve and gradually perfect a technique which will save the limb and also prevent grave permanent disability. Dr. Ewing recently, in Washington, struck a very true note when he stated that in most cases of recurrence the surgeon should realize his imperfect operative technique.

The present case is that of an undergraduate nurse, a patient of Dr. Stevenson, who was quite able to do her work until March, 1924. At that time she complained of some pain and weakness in the right hip joint. The condition gradually became aggravated until she was obliged to go off duty and to lie up most of the time. At that time there was some tenderness of the joint, but she had full movement; the x-ray showed some rarefaction of the neck of the femur (Fig. 1). The pain and weakness became more pronounced and an x-ray, taken in June, 1924, showed more rarefaction and a coxa vara condition (Fig. 2). In August, 1924, when turning over in bed a pathological fracture of the neck of the femur was produced (Fig. 3).

On December 23, 1924, I saw the patient and the problem naturally was to determine the cause of the fracture; whether it was fibrocystic disease or tumour. We were rather more inclined to believe that it was a giant-celled

* Read before the Montreal Medico-Chirurgical Society, April, 1928. Received for publication, August 16, 1928.


FIG. 1


FIG. 2

tumour. The operative problem was grave, as there was a marked loss of continuity in the neck of the femur, due to the extensive tumour involvement which left a mere shell with a fracture in the middle of the neck.

On December 26, 1924, the joint of the femur was exposed widely by the Smith-Peterson incision. The neck of the femur was found to consist of a soft shell from the acetabular rim well down to the trochanter, the fracture being felt about the middle of it. A flap of this shell was reflected and the contents were found to be


FIG. 3

of the typical jelly-like consistency. This material was carefully spooned out and the lining was found to be smooth, except at each end. When it was swabbed out the cavity was left remarkably dry and practically no oozing was noted. The ilium was then exposed and a number of bone slivers were chiselled off and packed firmly into the cavity. One piece seemed to pierce through the shell into the acetabulum. The flap was then sutured in place, and the result was a fairly firm mass representing the neck of the femur. The wound was closed, and a long plaster spica applied.

There were no untoward symptoms after operation until about March, 1925, when Dr. Stevenson found a swelling below the trochanter. This corresponded to an x-ray appearance which we had noted in December but had let alone, as we did not like to excavate the whole trochanter at the time. He exposed this swelling and carefully cleaned out the tumour and closed it up. This healed *per primam*. For eighteen months the patient was kept recumbent, and then fitted with a caliper walking brace. The bone seemed to regenerate firmly in the neck of the femur and below. I show an x-ray taken in June, 1927, which demonstrates strong bone and a moderate coxa vara (Fig. 4).

Pathological examination of each specimen by Professor Oertel and Professor Rhea showed a typical giant-celled tumour (Fig. 5).

The report in June, 1928, is that this patient walks with a slight limp, without pain, with full range of movement, and that she can


FIG. 4

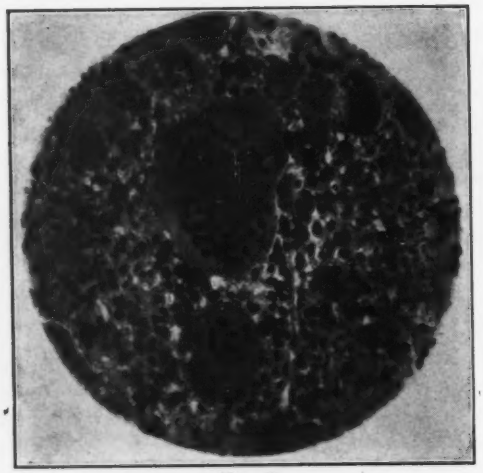

FIG. 5

endure a full day's occupation. As this report is made three and a half years after operation we are encouraged in the belief of probable cure. I can offer no explanation for the vascularization of these pieces of autogenous bone-graft to form a firm supporting osseous structure replacing the original neck of the femur. The cavity in which they were placed at the time of operation seemed dry, and close inspection showed practically no oozing of blood into the cavity.

## EMBOLISM OR THROMBOSIS OF THE CENTRAL RETINAL VESSELS?*

BY ANTONIO CANTERO, M.D., C.M.,

*Quebec*

The central artery and vein of the retina are both liable to be suddenly obstructed, and the result is sudden and usually complete loss of sight. The first case of this kind was seen by Graefe in 1858. Since that time somewhat similar cases have been reported, but when we find the retinal circulation suddenly obstructed we must use some care in making a differential diagnosis between embolism and thrombosis. The following case is of some interest, and may serve as an illustration.

A white male, 33 years of age, by occupation a steel worker, was admitted to the hospital complaining of sudden loss of the sight of the right eye and epistaxis.

*Family History.*—Negative.

*Personal History.*—Denies having had any diseases of childhood; in 1915, pleurisy; in 1918, an attack of jaundice which lasted three weeks; in 1921, gonococcal infection. Lues was denied.

*History of the Present Illness.*—Eight weeks previous to his admission the patient was returning home from church when he noticed a sudden loss of sight in the right eye. He described it as if a dark curtain was pulled suddenly down in front of the eye. He consulted someone who gave him thirty-eight ultra-violet treatments to the eye. Since then there has been total blindness of the eye, and there have been no signs of improvement.

*Physical Examination.* — The patient was found to be suffering with a definite cardiac lesion, *i.e.*, mitral stenosis and aortic regurgitation; systolic blood pressure of 110; otherwise his other systems were negative. Urinanalysis, negative. Blood count: red blood cells, 4,200,000 per c.mm.; white blood cells, 4,400 per c.mm.; hæmoglobin, 78 per cent. Blood Wassermann test, 4 plus.

Opthalmoscopic Examination.—Left eye was normal. Right eye; a gray opacity, situated about the region of the macula and the optic disc

* From the service of opthalmology and otolaryngology, Jeffery Hale's Hospital.

was noted. There was a definite retinal haze. The fovea centralis could be made out, shining as a cherry-red spot. About it small vessels of the macula appeared and, though concealed in the opacity, they shone out in bright contrast to the white background. Pressure upon the globe evoked no pulsation of the arteries or veins.

By contrast, in thrombosis of the vein the arteries are diminished, but not empty and thready; the veins are of increased size; the nerve is whitest or is easily congested. Opacity in the retina, when it appears, develops quickly and may be very extensive; the fovea will have a bright red colour if the retina is opaque. Pressure may not cause pulsation, yet it has been produced in the veins. Vision is greatly reduced and may be destroyed, but eccentric sight sometimes remains, and improvement sometimes occurs.

## SUMMARY

To recapitulate our findings: (1) The sudden and total loss of sight, with the absence of any improvement. (2) The definite cardiac lesion. (3) The classical opthalmoscopic picture, *i.e.*, the arteries shrunken and the smaller ones invisible; veins reduced in size, especially at the optic nerve; the absence of retinal hæmorrhage; and the grayish white opacity about the region of the macula.

It should be noted that the milk-white opacity of the retina and the vivid redness of the fovea are common to many kinds of stoppage of the retinal circulation, and that too much stress should not be put upon the findings in making a differential diagnosis.

With the clinical history and opthalmoscopic findings, the diagnosis of embolism of the central retinal artery is justified in the above case.

The prognosis is bad.

General treatment for his cardiac lesion was advised; with specific treatment for syphilis; *i.e.*, a full course of arsenic.

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**Diabetes of Ovarian Origin.**—Carnot, Terris, and Caroli describe the case of a married woman, aged 36, in whom diabetes had not been relieved by anti-diabetic diet. The glycosuria amounted to approximately 100 grams daily; acetone and diacetic acid were sometimes present. The blood sugar was never more than 2 grams. The patient lost more than 22 pounds in weight in two months and became much weaker. Two preparations of insulin were administered without result, except that diacetic acid disappeared from the urine. Prior to the first symptoms of diabetes menstruation was delayed, scanty, and finally absent, but before it ceased altogether it was noticed that the glycosuria increased a few days before the period. Apparently the ovarian endocrine action reduced the quantity of blood sugar. An ovarian extract was injected in doses of 1 c.cm. every second day. After the second injection a rapid fall in the glycosuria occurred, and the patient's ovarian pain disappeared. The general health improved rapidly, and the patient gained 11 pounds in ten days; menstruation reappeared normally after an absence of three months. The patient lost the saccharine taste in her mouth and her excessive hunger. Some days after the last injection of ovarian extract glycosuria increased, but it was reduced by a further series of hypodermic injections. The authors conclude that there is a close relationship between ovarian disturbances and diabetes, and that ovarian extract may reduce glycosuria and hyperglycæmia when insulin has failed.—*Brit. M. J.*, 1928, ii, Epit. 15.

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**Skin Eruptions with Phenobarbital (Luminal).**—The three cases reported by William C. Menninger are the only cases in which the skin rash appeared in approximately four hundred cases in which phenobarbital has been used. From the data at hand, no relationship can be drawn between the amount of the drug and the weight of the patient. Phenobarbital may produce an urticarial reaction, or it may produce a scarlatina-like or morbilliform maculopapular erythema. In approximately 50 per cent of the reported cases of the latter condition there has been an associated pyrexia and other systemic toxic symptoms. In the face of the widespread usage of the drug, the number of cases showing such a toxic reaction must represent a very small percentage. A distinction should be made between the toxic reaction and the poison reaction. In the former, many of the cases do not show any particular relation to the dosage of the drug, and skin reactions have appeared frequently on small doses. It seems to Menninger that the cause must be a selective tissue reaction to the drug, dependent on constitutional factors about which we are still ignorant.—*J. Am. M. Ass.*, July 7, 1928.

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**An Early Conception of Wound-Infection.**—"Upon the solution of Unity in any part of the ambient air . . . .repleted with various evaporations or aporrhœas of mixt bodies, especially such as are then suffering the act of putrefaction, violently invadeth the part and thereupon impresseth an exotic miasm or noxious diathesis, which disposeth the blood successively arriving at the wound to putrefaction, by the intervention of fermentation." *Van Helmont* (1577-1644).

# Clinical and Laboratory Notes

## A SIMPLE APPARATUS FOR THE CONTINUOUS INTRAVENOUS ADMINISTRATION OF PHYSIOLOGICAL SALT SOLUTION

BY R. I. HARRIS, M.B.,

AND

W. O. STODDART, M.B.

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*Toronto*

There are technical difficulties associated with the intravenous use of salt solution which make an improved method of administration desirable. The value of large amounts of fluid in the treatment of certain surgical conditions is universally conceded, but in those illnesses in which it is most valuable its administration by ordinary channels is often impossible. Under such circumstances, intravenous injection of salt solution is the most satisfactory method for the parenteral administration of fluid. To the intravenous injection of salt solution, as ordinarily practised, there are objections and limitations, and these difficulties are particularly great in children. If we consider intestinal obstruction as an example of a surgical condition in which the use of large amounts of fluid is a valuable form of treatment, it is evident that, to be of most value, the fluid must reach the circulation in quantities sufficient to compensate the large amounts lost by vomiting, and should be given at frequent intervals, or, better still, continuously, for the whole of the period in which the toxæmia of the obstruction is present. As ordinarily administered, the salt solution is injected into a vein once or twice daily. This intermittent administration is inadequate, since the need for the salt solution is continuous. It also limits the amount of fluid which can be given, since care must be taken to avoid overtaxing the heart. As a result, the amount of fluid given daily is apt to be less than the patient's requirements. In the case of children there are additional technical difficulties. It is rarely possible, except in the larger children, to introduce the fluid directly into the vein by puncture through the skin. In infants, it is true, the longitudinal sinus can be entered by a needle through the anterior fontanelle. In our opinion, the danger of intracranial hæmorrhage and of infection, though remote, is sufficiently great to make this route unsafe except as a last resort. To administer fluid intravenously to a child ordinarily necessitates the exposure of a superficial vein through a skin incision under local anæsthesia. Since each intravenous administration can only be accomplished by a minor operation, and as the need for salt solution ordinarily extends over several days, several minor operations must be performed. The frequent repetition of this procedure is open to obvious objections: it is unnecessarily disturbing to the patient; the available veins are quickly used up; and several wounds are produced, each of which incurs the danger of infection. The natural desire to reduce to a minimum the frequency of the procedure leads to the administration of as large a quantity of fluid at one time as is judged safe. Under such circumstances, it is easy to overstep the margin of safety, and by the rapid administration of too large a quantity of fluid to overtax a feeble heart or failing circulation.

A consideration of these objections led us to the conclusion that the intravenous administration of salt solution would be greatly improved could the solution drip into the vein at a steady rate, but sufficiently slowly to permit its use for an indefinite period of time. Once started, the fluid could then be permitted to flow as long as the necessity for such treatment remained. The advantages of such a method are that the administration of the fluid is continuous, thus meeting the needs of the patient; large quantities can be given without overtaxing the patient's circulation; and it minimizes the amount of attention required. Certain technical difficulties must be met. The apparatus must be so constructed as to prevent contamination of the fluid by any organisms in the air. There must be means for determining the rate of flow. The rate of flow must be capable of ready adjustment. Care must be taken to avoid clotting in the cannula and infection in the wound.

We have succeeded in devising a piece of apparatus which fulfils these requirements and successfully permits the continuous administration of salt solution into veins for several days at a time. The apparatus has proved so satisfactory that we feel justified in publishing an account of it. The component parts are illustrated in Figure 1 with sufficient clearness to make detailed description unnecessary.

The technique of its use is simple. More than the usual aseptic care should be exercised, since the apparatus may be in use for several days. The receptacle for the fluid should be kept covered with a gauze and cotton filter. This should not be removed to renew the fluid, but, instead, a fresh flask should replace the empty one. By using large flasks (2,000 c.c. and 5,000 c.c. in capacity) they will not need replacing more than once daily. The small veins on the dorsum of the hand and foot are most convenient to use. Prior to preparing the vein, the wrist is fixed by a light anterior splint of cardboard or plaster. This permits the patient to move his arm about without disturbing the needle materially. Under local anæsthesia, a small transverse incision is

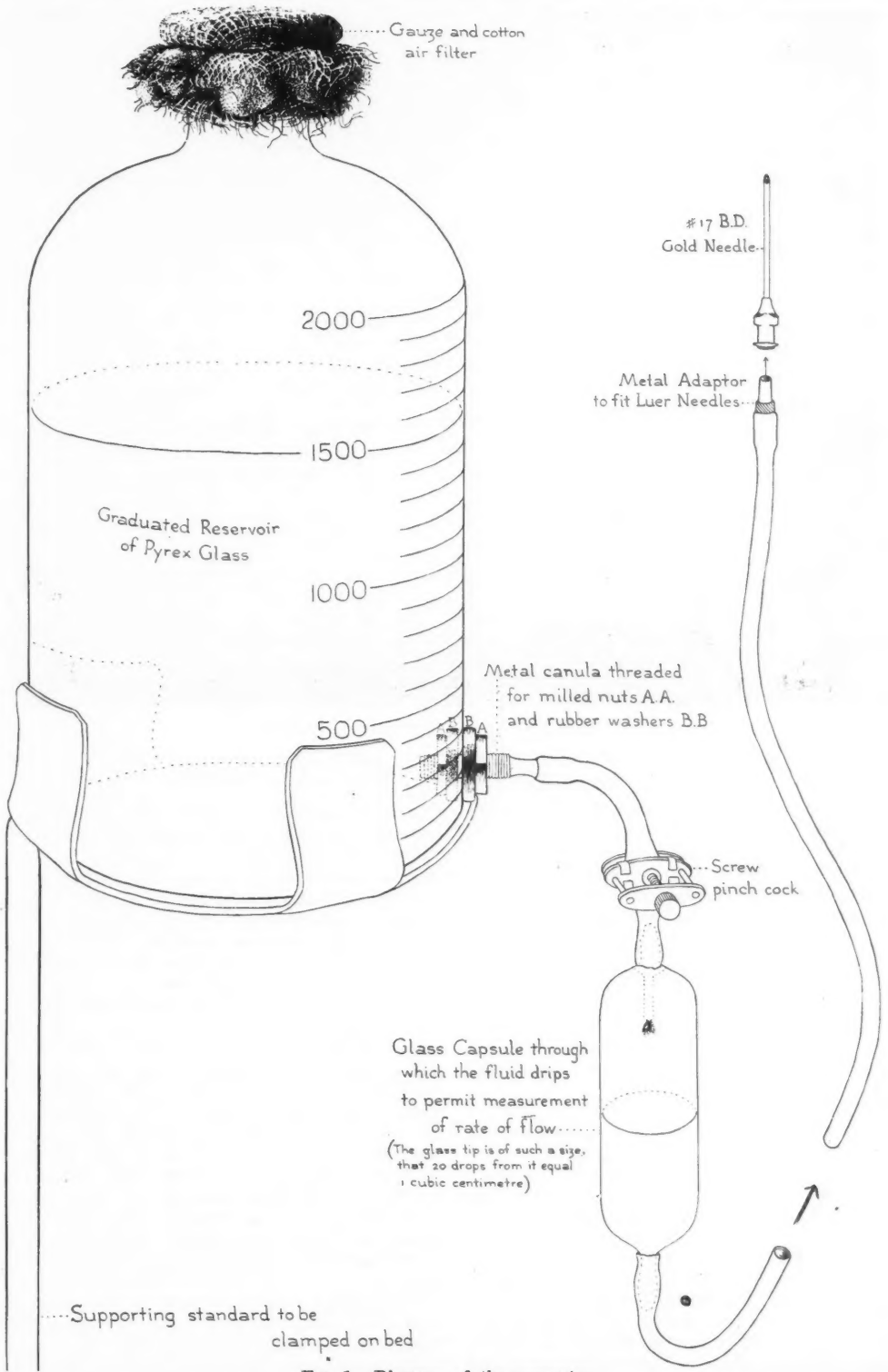


**FIG. 1.—Diagram of the apparatus.**

The reservoir is made of pyrex glass, in order to withstand the temperature of the autoclave in sterilization. The neck is capped with a gauze and cotton pad tied on. This is not removed as long as the flask is in use. When one flask is emptied it is replaced by a freshly sterilized full one. A hole drilled through the side of the bottle low down permits the insertion of a threaded metal tube which is held in place by nuts, and rendered waterproof by rubber washers. The screw-cock permits regulation of the rate of flow. The glass capsule through which the fluid drips permits estimation of the rate of flow at any particular moment, since the tip of the cannula in the capsule is of such a size that 20 drops from it equal 1 cubic centimetre.

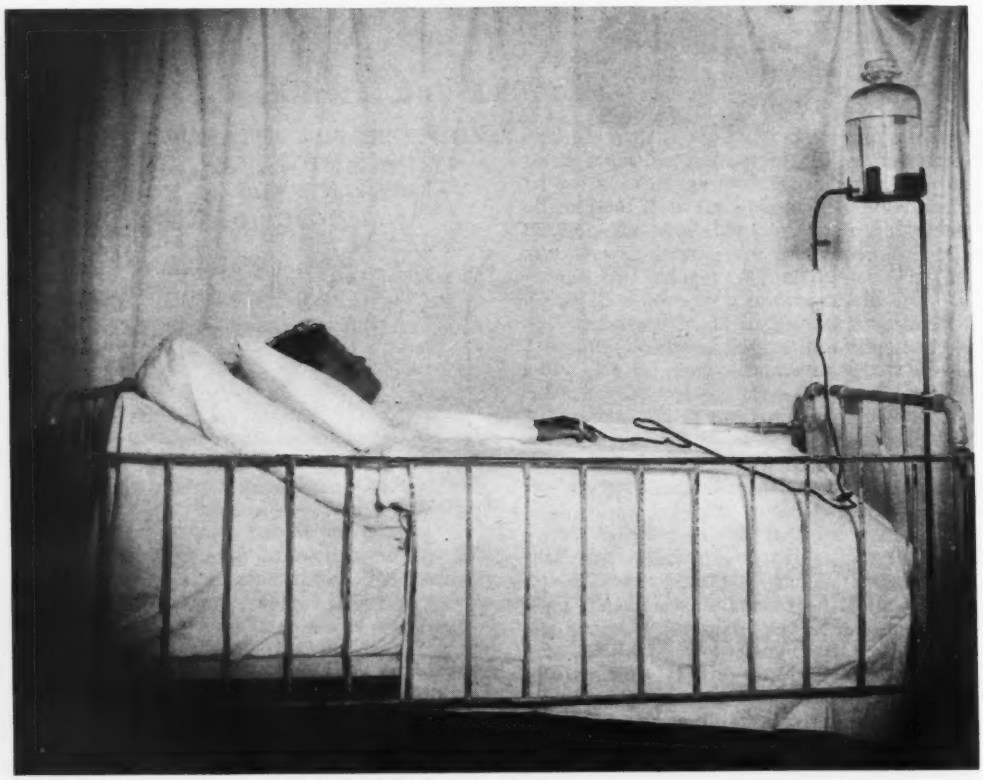

FIG. 2.—Photograph of the apparatus in use.

This picture shows the apparatus in use upon a patient suffering from intestinal obstruction following appendicitis. For more accurate delineation of details the dressings have been removed from the hand.

made over a vein, just large enough to accommodate a No. 17 gauge gold needle. The vein is ligated below, the cannula inserted through a small cut and tied in with catgut. A piece of sterile gauze is placed beneath the cannula to steady it and maintain it at a slight angle so that the opening in the needle will not be occluded by pressing against the side of the vein. The wound and needle are covered with a piece of sterile gauze and the whole secured by an encircling strip of adhesive tape. After connecting the rubber tubing to the needle, a pad is bandaged lightly over the whole, to protect and steady it.

There are a few points of importance, attention to which will facilitate the use of the apparatus. Glucose solutions should not be used. This substance in concentrated solutions produces thrombosis when injected into veins. This property is sufficiently marked to make glucose in 50 per cent solution one of the chemicals which are used in the injection treatment of varicose veins [1]. Even in the more dilute solutions (5 per cent and 10 per cent), which are so frequently used as intravenous medicaments, prolonged use will also result in thrombosis As a routine, therefore, glucose solutions should not be given. If it is considered necessary to administer glucose intravenously with this apparatus, the required amount should be given rapidly and be followed by physiological salt solution. Physiological salt solution, or Locke's solution, are the most satisfactory fluids for use in this apparatus (Locke's solution consists of sodium chloride, 0.9 per cent; calcium chloride, 0.024 per cent; potassium chloride, 0.042 per cent; and sodium bicarbonate, 0.01 to 0.03 per cent. It contains all the saline elements of mammalian blood in their proper proportions). Clotting in the needle gives little trouble if a small vein is used and if a steady flow is maintained. The rate of flow is readily adjusted by means of the screw pinchcock, so that any quantity up from approximately 500 c.c. per twenty-four hours may be administered. The rate of flow at any particular moment is readily estimated. The nipple from which the fluid drips through the glass cannula is of such a size that twenty drops from its end equal one cubic centimetre. By counting the drops the rate of flow per minute is readily calculated.

No attempt is made to heat the fluid before it enters the vein. To be effective, the heat would require to be applied to the fluid immediately before it entered the vein, since the rate of flow of the fluid is so slow that were heat applied at

the reservoir much of it would be lost before the fluid entered the vein. To add to the apparatus an appliance for maintaining the fluid at body temperature would add greatly to its intricacy. In our opinion, it is simpler to heat the patient by means of hot water bottles than it is to heat the fluid. As a matter of experience we have found that the administration of fluid at room temperature by this method gives rise to no more disturbance than does the administration of fluid of similar temperature by mouth.

The advantages of the apparatus are sufficiently great to have established it in our hospital. By means of it we have been able to administer adequate amounts of fluid to surgical patients with a very small amount of attention. It has been used continuously for as long a period as ten days, without any interruption in the flow and without any difficulties associated with the wound. The ease with which fluids may be administered intravenously with its aid has permitted us to give larger amounts of fluid over longer periods of time than was formerly the case. This has caused so distinct an improvement in results that we are disposed to think that previously the amounts of fluid we were administering were much too small.

There is a limit beyond which the administration should not be pushed. This varies greatly in individual cases, depending upon the amount of dehydration present and upon the amount of vomiting which is occurring, we have formulated a rough rule that the amount of fluid administered should not exceed 35 c.c. for each pound of body weight in twenty-four hours.

While originally devised to meet the needs of certain surgical conditions, such as the toxæmia of intestinal obstruction and of burns, the apparatus has been found so useful that it is now used in nearly all the conditions met with in hospital practice in which parenteral administration of fluids will be required for twenty-four hours or longer.

The apparatus may be obtained from Ingram & Bell, and from J. F. Hartz & Co., Toronto.

REFERENCE

1. MCPHEETERS, *Surg., Gynæc. & Obst.*, 1927, xlv, 541.

## NORMAL RANGES FOR LABORATORY FINDINGS

BY R. E. COLEMAN, M.B.

*Vancouver*

In response to a request we are here submitting a list of the "normal" ranges of body constituents as at present in use in the Vancouver General Hospital Laboratories. In using these the physician is reminded that the results of any laboratory analysis are but "a response to a technique," so that these "normals" are subject to changes of technique. For the same reason they may not be directly comparable in given instances with results from other laboratories.

| *Determination* | *Normal* |
|---|---|
| Basal Metabolism | −10 to +15 |
| Blood calcium, mg. per 100 cc. | 10 to 11 |
| Blood chlorides, mg. per 100 cc. | 588 to 630 |
| Blood creatinine, mg. per 100 cc. | 1 to 2 |
| Blood non-protein nitrogen, mg. per 100 cc. | 25 to 35 |
| Blood phosphorus, mg. per 100 cc. | 3 to 4 |
| Blood sugar, fasting, mg. per 100 cc. | 80 to 110 |
| Blood urea nitrogen, mg. per 100 cc. | 12 to 15 |
| Blood uric acid, mg. per 100 cc. | 2 to 3.5 |
| Spinal fluid, cells per cmm. | 0 to 5 |
| Spinal fluid, chlorides, mg. per 100 cc. | 725 to 740 |
| Spinal fluid, sugar | about ½ blood sugar |
| Fragility | beginning at 0.44%<br>complete at 0.36% |
| Phenolsulphonephthalein (P.S.P.) in two hours | 60 to 85% |
| Red blood cells per cmm. (men) | 4,700,000 to 6,100,000 |
| Red blood cells per cmm. (women) | 4,300,000 to 5,300,000 |
| Hæmoglobin, per cmm. (men) | 83% to 106% |
| Hæmoglobin, per cmm. (women) | 71% to 92% |
| Colour index (men and women) | 0.85 to 1.15 |
| White cells per cmm. | 5,000 to 10,000 |
| Platelets, per cmm. | 280,000 to 540,000 |

In the case of glucose curves, two hourly urine tests, and fat in the stools, the physician will find it more satisfactory to consult the laboratory staff since the normal range is not so easily expressed as are the above.—*Bulletin of the Vancouver Medical Association*, 1928, iv, 286.

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**Primary Sarcoma of Lower Lip.**—J. Vincent Falisi reviews fifteen cases already on record and reports one new case, occurring in a male, aged about 35, an ex-soldier and farmer, who had never served in the tropics and, aside from the usual diseases of childhood, had not had any illness of interest, though for a number of years he had had psoriasis. He stated that he had never had any venereal disease, and did not use alcohol and tobacco; no evidence of trauma to the lip could be elicited in his history. As a result of deep roentgen-ray therapy and radium therapy, there was a decided decrease in size. However, six months later, roentgen-ray examination of the chest revealed probable metastasis in the left lung. Death occurred shortly afterward. At the necropsy two nodules of new growth were found in the left lung.—*J. Am. M. Ass.*, June 23, 1928.

**The Irradiation of Milk.**—Nearly two hundred delegates, representing forty-two countries, were present at the World Dairy Congress in London recently. During the proceedings it was shown that milk treated with ultra-violet rays had proved its efficacy both as a preventive of rickets and as a cure. Dr. Wilhelm Hoffman, of Vienna, in a paper on "Activated Milk," said that from a prophylactic point of view the sale of a cheap activated milk to the masses was even more important than the direct treatment of the human body with artificial sunlight.—*Brit. J. Actinotherapy*, 1928, iii, 95.

# Editorial

## THE INTERNATIONAL CONFERENCE ON CANCER: A GENERAL SURVEY

THE first International Conference on Cancer, convened in London by The British Empire Cancer Campaign, an event of momentous importance, has come and gone. It is now in order to take stock of what has been accomplished. The "practical" man would doubtless say, "Very little." Yet this would be a most unfair and unfounded conclusion. It may be frankly admitted at the outset that we are still as far from a comprehension of the nature and cause of cancer as before. This is not to say, however, that no progress was made. It was surely a great gain that experts should have gathered from different countries, to record experiences, to exchange ideas, and to devise more comprehensive ways of attacking the problem of cancer control.

For more than thirty years the cancer problem has been studied, but mainly from the laboratory viewpoint, and the solution is not yet. It is no depreciation of the splendid contribution of the research workers to say that it is not sufficient, and that light must be sought in other directions also. This was one of the conclusions reached by the Conference. Such matters as the influence of heredity, locality, occupation, diet and race in the etiology of cancer need to be more fully studied, and this can only be done by the laborious accumulation and scientific analysis of facts and more facts. This task calls for the united and co-ordinated efforts of local investigators, central health authorities and international bodies, such as The British Empire Cancer Campaign and the Cancer Commission of the League of Nations.

The discussion on Etiology was opened by Professor James Ewing, of Cornell University, along general lines, and was participated in by many eminent authorities. The parasitic theory of cancer production found an able champion in Professor Borrel, but apparently received a mortal blow from the work of Dr. James B. Murphy and Professor Archibald Leitch. The dramatic climax of the Conference was reached when Dr. Murphy, of the Rockefeller Institute, announced that, working with the Rous chicken sarcoma, he had been able to isolate a growth-producing substance which he regarded not as a virus but as something of the nature of an enzyme. This substance, which he had obtained and purified by fractional precipitation of the proteins in an extract of the chicken tumours, was capable, when injected, of producing tumours in fowls with great regularity. The agent in question was more resistant to the action of ultra-violet rays than were bacteria and viruses. Dr. Murphy thought it hardly conceivable that this active fraction, a substance purified by repeated precipitations, could carry with it through all the manipulations any living organisms or virus. The final and crucial proof, however, lay in the isolation of the same substance from material that certainly did not contain a virus. This he had been able to do. By a similar technique he had isolated from such normal tissues as the testes of normal fowls, which had not been in contact with any tumour-bearing animals, a similar substance with which he had produced the typical tumour, transplantable in more than ninety per cent of fowls. The work of Professor Leitch, of the Cancer Hospital, London, on the Rous tumour, carried out independently, tended to confirm Dr. Murphy's conclusions.

These remarkable observations, while they do not solve the riddle of malignancy, yet probably indicate an advance in our knowledge, and open up a new biological problem of far-reaching significance. The prospect is alluring, but more work along these lines is called for before the final appraisal of the findings of Murphy and Leitch can be made.

On the engrossing subject of the value of lead in the treatment of malignant disease Professor W. Blair Bell, of Liverpool, read a paper entitled, "Chemotherapy in Malignant Disease" (*Lancet*, 1928, ii, 164) in which

he states his opinions very temperately. He believes that "there is a considerable body of evidence supporting the view that by itself lead, even in the crude preparations now used, can cause the disappearance and apparent cure of malignant neoplasms in favourable circumstances, and can sometimes beneficially affect leukæmia and other neoplastic conditions". Professor Bell also felt that the effects of radiation were augmented by the previous use of lead, and that the employment of lead as a prophylactic measure against recurrence after surgical operations for cancer will be held to be of great value. The discussion that followed was summarized by the Chairman, Sir Thomas Horder, when he said that it must be admitted that some patients have got well after treatment with lead and as a result of it. At the same time, the method was not so safe that physicians should assume the responsibility of advising their patients to submit to it, and that further research should be undertaken for lead preparations less toxic than those now in use, in the hope of widening the margin of safety at present dangerously small.

Perhaps the most immediately fruitful outcome of the Conference was the agreement of the members that radium was a valuable adjunct to surgery, and in certain cases had proved to be an efficient substitute for it.

## RADIUM THERAPY IN CANCER

IT is difficult to completely appraise the results of the recent International Conference on Cancer, beyond saying that it has helped to co-ordinate our existing knowledge of cancer. This was stated in advance to be one of the purposes of the Conference, and appreciation of its value from this point of view was well expressed in the opening address by His Majesty the King when he said that if the discussions led to advance in diagnosis, treatment, or even palliation of the disease, the Conference would have justified itself and earned the gratitude of mankind.

The full benefit of this assimilation of knowledge belongs, however, to the future, for we still have not solved the vitally important problems of the causation of tumours and the nature of their growth; but there is one aspect of the cancer question, whose growing importance was emphasized by discussions at the congress, namely, the value of radium in comparison with surgery in the treatment of certain types and at certain stages of cancer.

The use of radium has now passed well beyond the experimental stage. Not only has research increased our understanding of the physics of the element, and consequently its therapeutic applications, but enough time has elapsed since its first employment to allow some estimate to be formed regarding its ultimate effects. We know, for example, that tumours vary considerably in their sensitivity to radiation. Epitheliomata of the epidermis and of the oral region are specially sensitive, and their cure by radium may now be predicted with confidence. Cancers of the breast and of the cervix uteri are likewise sensitive to radiation, but treatment of these may be complicated by the degree of extension to deeper structures. On the other hand, rectal cancer is distinctly resistant to radiation, and adenocarcinomata of the uterus as well as that of other glands are likewise only slightly affected by radium.

If, however, research has defined the limitations of radium treatment there is conclusive evidence to demonstrate its value within those limits. There are now available for reference collected statistics whose analysis shows that the end results of radium treatment in the types of cancer mentioned, are, broadly speaking, as successful as those produced by surgical methods. This evidence is particularly plentiful in the case of cancer of the cervix uteri, one of the most exhaustive reports being that prepared by Dr. Janet Claypon, based on data published in sixteen different countries, and relating to records in about 80,000 cases treated by radium or surgery (Pub. Min. of Health, 1927, xl). Heyman, of Stockholm, (*Acta Radiol.*, 1927, viii, 3637) has also published statistics along these lines from twenty surgical and seventeen radiological clinics in Europe and America.

In such cases, therefore, radium can be said to show at least as good results as surgery, but there are other considerations to be taken into account. There is, for example, no "operative mortality" from the use of radium; that is, a patient may be considered an entirely favourable operative risk, and yet in a large series operation produces a definite mortality percentage which is practically absent when radium is used; and, in addition, there is a small but definite proportion of cases classed as inoperable which have been successfully treated by radium.

It may be accepted, therefore, that, with certain qualifications, radium and surgery are equally effective in dealing with cancer, whilst in combination they may serve to considerably augment each other's scope. There is little doubt, also, that if it were more generally known that surgery is not the only treatment for cancer, there would be less hesitation amongst the laity in seeking medical advice at earlier stages of the disease, which is an essential condition for success with any treatment.

The chief difficulty in the use of radium is the expense. It has been estimated that the cost of a quantity large enough to supply the probable needs each year in a country like Great Britain would be somewhere in the neighbourhood of a million dollars. This element of expense, together with the highly specialized technique required for its employment, brings the matter, as Sir Geo. Buchanan has pointed out (*Lancet*, 1928, ii, 160), into the sphere of "public action;" but even if this (not necessarily ideal) solution is not reached, there is still a very strong case for organized centralization. So far, radium treatment has been developed chiefly by the efforts of individual workers, carrying out observations on clinical results, but Professor Claud Regaud, the head of the first Radium Institute in the world, in the country in which radium was discovered, said at the Conference that he thought it would be a mistake to increase the number of centres for radium research, but that these should, as far as possible, be centralized. This is a matter which will depend to some extent on local conditions, but at present it would seem wise to develop a few centres to their fullest extent.

## IS STATE MEDICINE IN THE OFFING?

CONSIDERABLE concern has, in the last four or five years, been shown in the United States on the subject of the growing scarcity of medical practitioners in the rural portions of the Union and also on the high cost of medical service in the cities.

Evidence of this concern was given in a communication from the National Grange, an organization that includes 800,000 members who are engaged in agricultural pursuits, addressed to the American Medical Association, and read at its meeting in Minneapolis on June the 11th. In this communication the Grange pointed out the ever-increasing scarcity of physicians in the small towns and rural sections in the Union. There were in 1906, it says, 33,000 in places of 1,000 inhabitants or less, but in 1926 the number had fallen to 27,000 and, further, one-third of the towns of 1,000 or less, throughout the United States, which had physicians in 1914, had none in 1925. From the fact that the average age of death of physicians is 62, while the average age of rural doctors throughout the Union in 1925 was 52, it is predicted that the present generation of country doctors will have practically disappeared in another ten years. That the country doctor will disappear in a few years seems to be indicated also by the fact that only a very small percentage of those who have graduated in the last ten years have taken up the practice of their profession in rural districts, and as a result there are many scores of rural counties where not a single doctor who has received his degree since 1918 has settled. In consequence there are increasing hosts in the rural sections who are "medically helpless, while the cost of medical service, where it is to be had, mounts higher and higher."

That no relief for this situation will come from an increase in the number of those annually graduating as doctors is clear

The Commission on Medical Education has reported that the number of physicians in practice is actually decreasing, and that the number will not regain its present size, 130,000, until 1965. In the meantime the population of the country, the Commission estimates, will have increased from 115 millions to 165 millions.

One reason given for this decrease is, in the words of a Committee reporting last year at the Washington meeting of the American Medical Association, that "the medical profession does not attract so many qualified young men and women as formerly." This Committee also noted that a dangerous concentration of doctors in cities is taking place, leaving the rural communities without adequate medical service.

The National Grange believes that the cause of this growing scarcity is due to the greatly increased requirements for graduation, the increase from four to seven years to complete the curriculum, and the cost of a medical training $7,000 to $8,000 which must be borne by a young man, twenty-five or thirty years old, who, according to Dr. W. A. Pusey, a former President of the American Medical Association, "is not looking for an ordinary practice among ordinary people in the cities, or for any practice in the country."

The National Grange would change all this. It does not advocate a lowering of the standards, but more practical instruction, which may be acquired in less time and with the expenditure of less money than under prevailing conditions. It quotes the opinion of many physicians of the highest standing "that present medical education is not giving the most resourceful practitioners for ordinary service; it is producing practitioners who are dependent on hospitals and laboratories, while these facilities, according to authoritative medical opinions, are necessary in hardly more than ten per cent of illnesses and accidents." For the care of ninety per cent of the illnesses and accidents in rural sections independent resourceful physicians are needed. This ninety per cent of illnesses cannot be handled through distant doctors and hospitals. The National Grange believes that a proper medical training can be given a student in four years after he leaves the High School, instead of in the seven years now required.

The problem, according to the National Grange, must be solved by the medical profession. There has been, in the last twenty years, a decrease in the number of medical schools in the United States from 160 to 69. Many of those forced out of existence did useful service, while of those which remain nearly all receive large appropriations of public funds, but the direction and control of such has passed out of the hands of the people or their representatives. If the profession fails to remedy this situation, "it is for the people to determine whether it would not be good policy, as necessity demands, for the States to build and maintain medical schools solely under public control and responsive to the needs of humanity."

The response of the delegates to this communication from the National Grange was non-committal. In the discussion of it some of the delegates admitted the urgency of the need of more rural practitioners, but others maintained that the situation was not as serious as it was represented, and that there had been some improvement in it in the last few years, while another claimed that the problem is an economic one, but that it is true that the present system of medical education tends to specialization on the part of the profession and that it is difficult to induce the recent graduate to practice in a rural community, because he is instinctively tinctured with the idea that progress, that achievement, that personal advancement, can only be obtained through the medium of specialization or location in larger cities.

The Committee on Medical Education, which reported at this meeting of the Association, referred to the unrest with regard to rural medical service, to the expensiveness of medical service in general, and to the strong criticism directed at medical education from all quarters. It recommended that medical students should graduate and enter practice at an earlier age than at present, and that the medical course be reduced from four years of three quarters each to three years of four quarters each, and it expressed the opinion that the medical course is overcrowded with details and with detailed consideration of the specialties, and that it would be improved if it were much less crowded and more con-

fined to the essentials and the fundamentals. This report was unanimously adopted by the delegates!

In the discussion one of the delegates stated that the problem in this question is close to the heart of every one who is opposed to State Medicine, and another expressed the fear that one of the suggested solutions of the rural situation would lead to contract practice and incidentally put the stamp of approval on State Medicine.

In other quarters concern at the cost of medical service has been shown. A writer in the *Atlantic Monthly*, more than a year ago, dealt with this subject and pointed out that cases of midwifery in very moderately well-to-do circles now cost $500.00, whereas twenty to thirty years ago they did not involve more than $50.00. Dr. Wilbur, President of the Leland Stanford University, a medical graduate, impressed with the urgency of this subject, has organized a Committee on the Cost of Medical Care, to study and report on it. In a letter to the *Journal of the American Medical Association* which appears in the issue of June 30, he explains the reason for his action and refers to the widespread dissatisfaction of the public with the existing situation in medicine, in doing so quoting from the *Journal of the Michigan State Medical Society* of 1922: "The tendency of the day is that where any group of citizens cannot afford to purchase certain privileges, services, or needed comforts, the demand goes forth that the State supply to them that which they cannot now obtain. The State and County usually comply with pressing demands of its citizens. We are fearful that we are on the eve of such a demand from the people. What are you going to do about it?"

Dr. Wilbur remarks that in the same year the President of the Ohio State Medical Association made a similar statement and asked a similar question, and that there have been in the last ten years many warnings like these, but the medical organizations have done little in regard to the problem, and that is why his Committee was organized.

It is evident that the situation in the United States is serious. Is State Medicine in the offing? What will the effect be ultimately on the status of the medical profession in Canada?

A. B. MACCALLUM

## THE COST OF MEDICAL CARE

SOME months ago reference was made in these columns to a meeting held at Washington, at which it was decided to establish a committee to investigate the cost of medical care. This committee has now been formed with a total personnel of forty-two members. The Chairman of the committee is Dr. Ray Lyman Wilbur, President of Stanford University, and one of the few medical men to reach the distinction of appointment to the presidency of a large university.

Of Dr. Wilbur's Committee, slightly more than half hold medical degrees, and these represent various types of medical activity. Fourteen are private practitioners, while nine represent public health services. The remaining nineteen include eminent economists, representatives of various medical institutions and organizations, and a number who may be described as representatives of the general public. Dr. Winslow, Professor of Public Health at Yale is Vice-Chairman of the committee, and Chairman of the Executive. Harry H. Moore, Ph.D., of Washington, has been chosen as Director of Study.

A number of institutions which are interested in health problems have subscribed liberally to the support of the program, which will be carried on over a period of five years. For the first year it is expected that the expenditure will amount to sixty thousand dollars, while for succeeding years not less than seventy-five thousand dollars will be required annually.

The committee has recently issued a booklet describing its proposed activities, and from time to time journal articles will be published reporting upon various phases of the committee's researches. The ultimate question to be faced is how can practitioners'

equipment and technique, required in modern medicine, be utilized for the most efficient production of service. How can general practitioners and specialists, laboratory services, and various types of therapy, be most effectively organized into unit agencies? And how can unit agencies and services, both private and public, be best co-ordinated into a well balanced program of preventive and curative medicine? It is, however, felt that this ultimate question cannot be dealt with until the fundamental facts are made available. The present program of the committee is therefore limited to three groups of studies:

1. Preliminary surveys of data showing the incidence of disease and disability requiring medical services, and of generally existing facilities for dealing with them;

2. Studies on the cost to the family for medical services, and the return accruing to the physician and other agents furnishing such services;

3. Analysis of especially organized facilities for medical care now serving particular groups of the population.

The cost of medical care has been giving concern to members of the medical profession for several decades. We have realized for years that the poor man and the rich man are on practically an equal footing, so far as getting the best of medical attention is concerned, but that the man of moderate means is not able to afford the various tests made in the x-ray and other laboratories which have become so notable a feature of present day medical practise. We have hitched uneasily as we have made out accounts in which our own services have been rated more highly than in former years, and have endeavoured to excuse ourselves because the medical course has been lengthened and made more expensive. We have felt genuinely worried when it has been necessary to send patients to hospital who have refused to enter other than the private wards; and when it has been necessary to insist on the employment of a trained nurse in the home, or of a "special" in the hospital, conscience has troubled us greatly. We have realized that the modern disposition to prescribe the newer, and particularly the synthetic, drugs has added materially to the bills for medicines. So we are not unaware that the cost of medical care has been increasing rapidly, and that it has, in fact, become a serious burden to people of moderate incomes. To a certain extent only does it lie in our power to bring about any reform in the situation. We cannot control hospital fees, and nurses' fees; we can have little control over the fees of laboratory specialists; and our own fees must be such as to enable us to live. It is, therefore, rather disappointing to learn that the committee on the cost of medical care will not give particular attention to means by which the cost of medical care can be reduced. The committee has laid down a list of seventeen different subjects which it proposes either to study itself or to have some agency like the United States Public Health Service study for it. There can be no doubt that as a result of these studies we will have more exact knowledge than we now possess, but it is difficult to escape the doubt whether this will help us very much. We will almost certainly learn that all the blame for the increased cost of medical care cannot be laid upon physicians, but that a very considerable share of it is really attributable to those who complain most bitterly, persons whose incomes may be very moderate but who in case of illness will be satisfied only with what they regard to be the best of hospital accommodation and of medical and nursing care. The lady who got along comfortably a few years ago with fifty-cent cashmere stockings cannot to-day satisfy herself with anything but silk stockings at several dollars a pair, and must also have a motor car.

A very casual inspection of shop windows shows that it is not merely the cost of medical care which has advanced within recent years. We must pay more even for our corned beef and cabbage than we did a few years ago. The problem to which the committee has set itself thus has many angles, and it is not unlikely that the studies which have at present been set down will increase in number and perhaps may even closely approximate the number of varieties of food stuffs which a certain concern saves us the trouble of preparing. We may feel then that the committee has a large and difficult task. Just how useful its efforts may prove the future

alone can disclose, but the personnel of the committee leads us to believe that its deliberations will be safe and sane, and that much that will be of practical use will come out of its studies.

W. H. HATTIE

## THE CHEMICAL NATURE OF INSULIN

THE most definite means of ensuring chemical purity of a compound is its production in crystalline form. Three internal secretions have so far been so obtained, adrenine, thyroxine, and insulin. Adrenine, $C_9H_{13}NO_3$, with a molecular weight of 183, and thyroxine, $C_{15}H_{11}NO_4I_4$, with a molecular weight of 523 (65 per cent of which is due to four atoms of iodine), have, compared with starch, glycogen, and proteins, relatively small molecules. It is customary to consider that most of the internal secretions have such relatively small molecules. This would account for their easy passage through animal cellular membranes.

Until recently the most highly active insulin preparations were still amorphous in character. Investigators were forced to the conclusion that they were complex in character, corresponding to the protein derivatives termed proteoses. In 1926 Abel announced the preparation of insulin in crystalline form. Pyridine was used as the agent essential for the precipitation of impurities. Abel and his collaborators[1] prepared 0.53 gram of crystalline (rhombohedric) insulin from two grams of a commercial preparation evaluated at 13 international rabbit units per milligram. This gives some idea of the degree of purity of such solid amorphous preparations. The rabbit value of the crystals is at least 40, and possibly 60, units per milligram. That is, one-fortieth (perhaps one-sixtieth) of a milligram of pure insulin per kilogram rabbit is sufficient to produce hypoglycæmic convulsions in this animal.

Abel and his colleagues, assuming that one sulphur atom is present in the molecule of insulin, obtained the empirical formula $C_{45}H_{75}O_{17}N_{11}S$, while du Vigneaud[2], working in Murlin's laboratory, proved that the disulphide linkage of cystine (–S–S-) must be present, whence the empirical formula must be at least $C_{90}H_{150}O_{34}N_{22}S_2$. This corresponds to a molecular weight of 2,146.

Three recent papers from Abel's laboratory by du Vigneaud, Jensen, and Winter steiner[3], [4], [5] have amplified, but by no means completed, our knowledge of the chemical nature of the insulin molecule. They have shown that hydrolysed insulin crystals yield 8 per cent of cystine; 12 per cent of tryosine; 4.4 per cent of histidine; 3.2 per cent of arginine; and 2.26 per cent of lysine. The total nitrogen, 15.6 per cent, and the amino-nitrogen, 12 per cent, are in agreement with the supposition that the insulin molecule is completely or almost completely, built up from amino-acid radicals, so that the residual 70 per cent must consist in large part of radicals of the simpler amino-acids. Tryptophane is absent. The radical of a second sulphur compound appears to be present.

Assuming the correctness of these figures, the 8 per cent of cystine represents a molecular weight of the order of 2700, if but one cystine radical be present, while if 4.4 per cent represents one radical of histidine the weight of the molecule would be more than 3500. In all probability the molecule is therefore at least twice as large as du Vigneaud's first estimate. It is certain that the molecule of insulin is vastly more complex than those of adrenine and thyroxine, and that insulin itself must possess the general properties of a proteose.

In view of the importance that cystine and the cystine derivative glutathione have been shown to play in metabolic processes involving oxidation, it is interesting to speculate whether the cystine radical of insulin plays some similar rôle in the functioning of that compound. Although the clinical preparations of insulin adequately meet therapeutic needs, the wider knowledge of the compound that is now being acquired may lead, through better understanding of its mode of action, to even better and more systematic methods of treatment of pathological carbohydrate metabolism.

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A. T. CAMERON

# Editorial Comments

## POST-GRADUATE COURSES IN ENGLISH AT PARIS

An innovation of much importance is about to be initiated in Paris by the Association for the Development of Medical Relations between France and Allied Countries, under the auspices of the Dean and the Medical Faculty of Paris. It is the establishment of a course of lectures and demonstrations in English in medicine, surgery, pædiatrics, ophthalmology, oto-laryngology, morbid anatomy, and operative work on animals and the cadaver. Some of the most prominent clinical men in Paris will collaborate with their assistants in conducting this course, such as Professors Emile Sergent, Antonin Clerc, Armand Delille, Weill-Hallé, Antonin Gosset, Morax, and Lemaitre.

All are aware of the great prominence that Germany and Austria attained before the War in the matter of post-graduate courses in medicine. Vienna and Berlin attracted perhaps most of the English-speaking physicians from this side of the water, on account of their enormous clinical material, and the excellent systematized courses of instruction that were offered. Some of these courses were conducted in English. As a result, German ideals in medicine and German ideas in therapeutics were disseminated widely throughout Canada and the United States. While our French-Canadian confrères have always looked to Paris for their inspiration, the English-speaking physicians rarely did. Possibly, another reason for the attractiveness of the German schools lay in the fact that it was impossible for English-speaking physicians to get the same quality of work in the same space of time in England, where they would, naturally, have preferred to go. Now, however, things are improved. Post-graduate work of the highest quality can be obtained in England, under more favourable conditions than formerly, and there is less inducement to go to foreign countries. Nevertheless, it is of much advantage to get the points of view of our medical colleagues in foreign countries, and, therefore, we, in Canada, welcome this, the first serious attempt to interest English-speaking physicians in French clinical methods. Those of us living in the Province of Quebec, side by side with the French-speaking Canadians, are particularly interested in this movement to draw French and English medical men together. We wish it all success. Our special thanks are due to Dr. J. E. Dubé, Professor of Clinical Medicine in the University of Montreal, whose efforts, extending over the past two years, have at last been crowned with success; and to our contemporary *L'Union Médicale du Canada*, for its powerful aid.

The course in Paris will be given during the month of October, and the salient features of the program offered will be found elsewhere in this issue, (under "General News").

If we have any word of criticism it is that we doubt whether the month of October is the best time to stage this attractive curriculum. The university teachers, at least, will be greatly occupied at that time with planning their winter's work, and the practising physicians will have already taken their holidays, and will probably not wish to be away from home a second time. It is proposed, we understand, that the post-graduate course at Paris in English will be made an annual affair, if the first effort proves attractive enough. A better time than October, in our judgment, would be in summer or early spring. This is an important matter, as the success and continuation of the venture will in large part depend upon the attendance. The movement is a friendly gesture and is cordially commended to our readers.

## BACTERIOPHAGE AS A FILTERABLE VIRUS

The above was the title of a paper read by Bronfenbrenner[1] before the New York Pathological Society in December.

The idea may at first seem novel, even revolutionary, yet Rivers[2] in his review of the subject of filterable viruses places bacteriophage first in his long table of known viruses and in fact thinks it is the best example of a filterable virus we know. This need not necessarily lead to the interpretation that bacteriophage is a living agent, as Rivers again is still undecided whether filterable viruses are living and certainly the clinching experiment proving this has yet to be done.

The most plausible explanation of the bacteriophage phenomenon is that suggested by Bronfenbrenner who thinks it is a metabolite produced during bacterial growth which stimulates the

micro-organisms. This stimulation leads to accumulation of products in the cell and consequent water imbibition, the cell wall then rupturing from intracellular tension. In other words bacteriophage may crudely be compared with such a cellular metabolite as carbon dioxide which is a stimulant in low concentration. The essential property of bacteriophage is thus not *a priori* its property of destroying the cell, which is secondary, but its specific stimulating effect.

Bacteriophage and the filterable viruses (the latter term being used here in its usually accepted narrow sense of those which attack plants, animals or man, with the following properties in common, *viz.*, that they are filterable and invisible to ordinary microscopic vision, and have never been grown outside a living cell) both exhibit a marked specificity and the pathological changes produced by them are essentially the same. Bronfenbrenner, by means of cinematographic films, has demonstrated the sequence of events taking place when bacteria are exposed to bacteriophage. The micro-organisms first reproduce rapidly and increase abnormally in number, they then swell and rupture, the contents being extruded. This is in essence the intracellular pathological change which Rivers has depicted in the case of the virus diseases of plants and animals. The affected cells proliferate, increase greatly in size, then degenerate, and a vesicle is formed.

It seems safe to assume then that the bacteriophage is a filterable virus, whatever this may be, and the whole chain of living cells which may be affected by these agents is now complete, from the lowest known unicellular plant cells, bacteria, up the scale to plants, insects, fish, birds, mammals and man.

Perhaps these agents are after all "the intermediate form between life and death," as suggested by Professor Boycott in his address at the opening of the Pathological Institute at McGill University some years ago.

1. BRONFENBRENNER, J. J., Chapter in "Modern Advances in Bacteriology, etc.," Jordan and Falk, Chicago University Press, 1928.
2. RIVERS, T. M., Filterable viruses, Williams and Wilkins, Baltimore, 1928.

ARNOLD BRANCH

## THE "TENNIS ELBOW"

Some little interest has been taken recently in the medical and surgical aspects of sport. In a former number of this *Journal* (1927, xvii, 1324) there appeared an article by Drs. L. J. Austin, and W. A. Campbell, of Kingston, on injuries of the knee due to playing football; and in the *British Medical Journal* (1928, i, 12), is one by Mr. G. Percival Mills on the treatment of "Tennis Elbow." Quite recently, too, a considerable volume, covering the whole gamut of sport, has been produced by a German scientist, whose name has escaped us, dealing with the subject with German thoroughness.

It may not be inappropriate, now that the days consecrated to sport are upon us, to consider the condition termed by Mr. Mills "Tennis Elbow." This is a condition almost confined to tennis-players, golfers, and those who must constantly wield a hammer. It comes on insidiously and there is seldom any history of accident or sudden strain. The person affected can usually perform any movement with his arm without pain except one, which invariably causes pain. During the acute stage the patient will often drop a teacup when reaching forward to take it off a tray. This is often diagnostic. A tender spot can usually be recognized just above or below the external epicondyle, and the pain can often be elicited by complete flexion of the wrist and fingers Mr. Mills adopted the following procedure with success. Under nitrous oxide anæsthesia, he flexed the wrist and fingers, fully pronated the forearm, and then forced the elbow into hyperextension, at the same time making firm pressure over the tender spot by the external condyle. There may be heard a click or snap, or even a loud noise, under this manipulation, though often the snap can only be felt.

In chronic cases part of the trouble may be due to adhesions, but it is hard to resist the conclusion, in the acute cases certainly, that something is out of place. It is suggested that in acute cases a portion of the orbicular ligament may slip between the head of the radius and the capitellum.

## BIBLIOTHECA OSLERIANA

We have received word that efforts are being made to ship the Osler Library to Montreal before navigation closes. Arrangements for the packing of it will commence early in September. It is doubtful however if the catalogue will be ready by that date, but it is hoped that it may appear before the end of the year. This catalogue is to a large extent annotated bio-bibliographically. Many of the notes were made by Sir William Osler himself. Seven hundred and fifty copies of the catalogue will be on sale. We hope in our next issue to present our readers with a more detailed account of this most interesting library.

## ERRATUM

The footnote to the editorial on p. 216 of the August issue should have read "Dr. H. H. Murphy," instead of "Dr. G. H. Murphy"

# Special Articles

## REPORT OF THE BRITISH COMMITTEE ON VACCINATION

The report of the committee appointed by the Minister of Health in Great Britain, in conjunction with the Medical Research Council, in February, 1926, to investigate certain problems which have arisen in connection with vaccination, is just issued[1]. In it the committee reports on details of the preparation, testing and standardization of the lymph, as well as on the means taken to ensure its purity and freedom from other germs which might do harm, and the most desirable and efficient method for performing the operation is discussed. An abstract of the report is herewith presented.

The lymph used at present in England for vaccination is prepared at the Government lymph establishment. The seed lymph employed there was derived from calf lymph received from Cologne in 1907, and its quality has been maintained by cutaneous passage through the rabbit. Transference from calf to calf was found to lead to deterioration in the lymph and unsatisfactory vesiculation. The report emphasizes the desirability of discovering some method of producing lymph absolutely free from extraneous organisms. Carrel and Rivers have shown that the vaccine virus proliferates when grown *in vitro* in contact with chick embryo cells, and that by this method the potency of the virus is greatly enhanced. It has also been found possible to inoculate rabbits by the intracerebellar route, and it is claimed that the product yielded is very considerable and suitable for human vaccination. Lymph produced by either of these processes it is claimed would be free from any contaminating organisms.

Experience shows us that, notwithstanding the great value of vaccination, certain risks do occur, though their percentage is very small. Certain recommendations made by the commission appointed, in 1889, to investigate the cause of these accidental occurrences made the following changes in their instructions:—The age period for vaccination was extended to six months after birth; certain technical regulations were advised to ensure cleanliness and the avoidance of sepsis and erysipelas; tubes were recommended to be used instead of dry points; and the vaccinator was directed to render medical attendance in case of any illness supervening if asked to do so by the parent. As the result of these new instructions, a reduction in the number of fatalities following vaccination was immediately noticed. In the five-year period 1886 to 1891 in which 4,290,000 infants were vaccinated, there were 279 deaths at all ages. During the fifteen years from 1910 to 1925, 5,500,000 infants were vaccinated, with only 128 deaths. The present report suggests that the system of inspecting the patient on the seventh day is not desirable; an inspection should be made at some time during the second week; and a second inspection should be obligatory in the third week. It recommends that the principle of stational vaccination be adopted instead of the present system of domiciliary vaccination, and states that careful investigations made do not afford any evidence that vaccinia increases the liability to disease, either general or specific, nor does it appear to aggravate a disease already established.

In 1922, a few cases were reported in the medical press in which it was stated that a fatal encephalitis appeared to have developed as a sequence of a recent vaccination. In the following year, a larger number of cases occurred in which death was said to have been due to an attack of encephalitis following a recent vaccination. Investigation of these cases by a special committee showed that 11 cases occurred in London in the autumn of 1922, and a second group of 49 cases occurred in the summer of 1923, chiefly in provincial districts. Extensive investigations regarding these brought out the fact that the number of cases of post-vaccinal encephalitis bore no direct relation to the number of persons vaccinated, although there appeared to be an undoubted association in time between the post-vaccinal cases of encephalitis and the prevalence of vaccination throughout the country generally; charts showed, however, that the period of 1923, during which the majority of post-vaccinal cases occurred, was immediately antecedent to the development of an epidemic of poliomyelitis and polioencephalitis throughout the country. The committee expressed the opinion that it appeared extremely improbable that the cases could have been due solely to the vaccine virus; it was conceivable that a virus, such as that of poliomyelitis, which could only occasionally set up encephalitis in an individual in normal health, might, if another virus such as that of vaccinia was present in the brain, be enabled to do so. Evidence was not sufficient to declare the vaccine virus to be the sole cause of the disease, but the committee, after their investigation, considered that it was probable that the co-operation of some other organism besides that of the vaccinia existed in these fatal cases. Furthermore, it was stated that a condition similar to post-vaccinal encephalitis has occurred independently of recent vaccination or of the development of any observed exanthemata.†

[1] Report of Committee on Vaccination. H. M. Stationery Office, pp. 303; 18 appendices with charts; 7s. net.

† Recent reports in the daily press state that the League of Nations' Health Committee has received information regarding the increasing frequency of the development of encephalitis lethargica after vaccination. The situation has become so bad in the Netherlands that compulsory vaccination in the public schools is said to have been suspended for a year.

The efficiency of the various methods of vaccination in producing complete immunity was investigated by Dr. A. F. Cameron and Dr. Brownlee at the beginning of the present century. Dr. Cameron's conclusions were that protection against a fatal issue in an attack of smallpox was directly related to the number of scars and to the area of the cicatrix; and for all practical purposes the period of effective immunity may be regarded as not less than seven years.

The mild type of smallpox which has prevailed in Great Britain for the past five years has been benign, with an almost negligible mortality. As a result there has arisen a marked disinclination to submit to adult vaccination. It is affirmed that vaccination is worse than the disease, and that it is commonly possible to continue at work with little or no discomfort during an attack of this mild form, whereas abstention from work is generally necessary after vaccination. Owing to this fact, and in order to render vaccination acceptable without impairing its efficiency, the committee recommends that an effort should be made to reduce to a minimum the amount of trauma inflicted in vaccination. It considers that it is possible to secure success by a technique consisting of the infliction of a single linear incision, not more than one-fourth of an inch in length and strictly limited to the epidermis. If in this way we ascertain the smallest amount of virus sufficient to produce immunity it might be found possible to produce a vaccine which would cause less local and less general reaction than now frequently results.

## ACCIDENTAL FATALITIES FROM INJECTIONS OF SERUM

By H. E. MacDermot, M.D.,

*Assistant Editor*

*Montreal*

There is more than one recorded instance of fatal results attending the administration of diphtheria toxin-antitoxin. In one series of cases at Baden, in 1923, the pure toxin was given by mistake; in another series at Dallas, Texas, there was an error in the mixing of the toxin with the antitoxin; in yet another, at Bridgewater and Concord, Mass., the toxin-antitoxin had been frozen and thawed before use, with consequent destruction of the antitoxin fraction. The investigations into these accidents clearly showed how they came about, and the results in each instance were such as might have been expected under the circumstances, but the latest occurrence of the kind in Australia presents somewhat unusual aspects. The events in brief were as follows*:

The public health authorities of Queensland had instituted a course of active immunization against diphtheria by the accepted method of inoculation with toxin-antitoxin, and the work was begun in the city of Bundaberg by the local medical officer of health, in January, 1928. The serum used was prepared by the Commonwealth Serum Laboratories, Melbourne, and was distributed generally throughout the State. Its preparation had been in accordance with accepted methods, but for certain reasons it was decided not to add any antiseptic. To offset this, however, it was at first arranged to issue it only in sealed glass ampoules, each one of which would be a single dose; but later on the serum was sent out in rubber-capped bottles containing enough for several doses, thus involving the withdrawal of the material from the same bottle several times. A warning as to the absence of antiseptic in the bottles and the possibility of contamination of their contents by repeated withdrawal was issued, but was not given sufficient publicity; at all events, the information did not reach the medical officer at Bundaberg.

In the course of ten days a total of 31 children in Bundaberg were inoculated from the one bottle of serum, and at first nothing unusual was noted. But on January 27th, of 21 children who received toxin-antitoxin (13 of them for the first time, and 8 for the second time) 12 became violently ill within five to seven hours, and died in from fifteen to thirty-four hours; 6 developed severe but not fatal symptoms; and 3 remained perfectly well. The ages varied from one year and three months to nine and a half years.

In the subsequent inquiry by a Royal Commission there was some difficulty in collecting the precise information necessary to explain what had taken place. The clinical study of the cases had been admittedly incomplete. The blood had not been examined; there were no notes on the condition of the nervous system; no urinalyses had been performed; even the actual descriptions of the symptoms were vague and in some cases inexact. It is pointed out by the Commission that these defects were the consequence of local conditions which made it virtually impossible to do any more than was done to deal with the emergency. The facts as finally established, however, showed that in the fatal cases the symptoms had been sudden and overwhelming. They were practically the same in each; vomiting at the outset, soon followed by diarrhœa, but with no blood in the stool or bowel washing; fever which declined rapidly in those that recovered; extremely rapid pulse, with rapid, shallow respirations; and terminal cyanosis and convulsions. The children that recovered all developed abscesses at the site of inoculation, from which later on *S. aureus* was cultured in five cases.

The pathological evidence was similarly incomplete, since no trained pathologist was available for examining the bodies, except in one case, and that was only after an interval of fifty-two hours. Autopsies were performed in nine cases, but there was no bacteriological examina-

*A comprehensive report is to be found in *The Medical Journal of Australia*, Vol. II, Nos. 1 and 2, July 7th and 14th, 1928.

tion of the blood or other tissues; microscopical sections were not made, and what material was kept for later examination was not suitably preserved, and yielded but little information. Again, however, it was possible by careful analysis of the information available, for the Commission to reach fairly definite conclusions. In their opinion the post-mortem findings indicated an acute toxæmia of an unspecified nature.

The next step was the examination of the unused contents of the bottle of antitoxin, and here the most important evidence was obtained, since it was found that the material was heavily infected with *S. aureus*, identical with the form isolated from the local abscesses. The serum was undoubtedly sterile at the outset, and that it was possible to keep it so by careful sterilization of the cap before each puncture, and by not allowing long intervals to elapse between each withdrawal, was shown in the case of other practitioners who followed these precautions with the same stock bottles, and who had no mishaps; moreover bacteriological examination of these other bottles proved them to have remained sterile. The fatal inoculations had been performed with admittedly imperfect technique, in a room not specially free from dust, and with an electric fan keeping up a current of air. It was shown experimentally by the Commission that contamination of the bottle under these conditions could have occurred very readily.

Among the many interesting points raised by these facts we may refer to the extraordinary, if not unprecedented, rapidity with which the symptoms developed after the injection, even granting that living organisms were in the serum. So striking was this feature that it was necessary to consider the possibility of death having been due to anaphylactic shock. This view, however, was set aside as not being in full accord with the facts: the symptoms had appeared on the first injection in some cases, and the interval between the first and second doses was too short in others, nor did the post-mortem findings point to a state of anaphylaxis. It is difficult also to see why there should have been such complete and uneventful recovery in some of the cases, except for the development of mild local suppuration. Metastatic abscesses were more to be expected but even the blood cultures taken on the third and fourth days of illness were sterile, as was also the blood in the case of the one autopsy which was fully carried out, although late after death. Finally, three of the children showed no effects at all from the same doses (apparently) of living organisms as proved fatal to twelve others. The theory of variation in susceptibility may be invoked to account for the differing reactions, but this explanation must of necessity be used guardedly.

These unusual responses, however, added considerable weight to the belief that living organisms and their toxins were responsible, rather than the toxin-antitoxin itself. In the previous accidents quoted there had been marked and constant inflammatory infiltration of the tissues around the site of the inoculation, a feature which was present in none of the Australian cases.

## Men and Books

### JOHN HUNTER*

BY THOMAS MCPHERSON, B.A., M.D., F.R.C.S.

*Victoria, B.C.*

John Hunter came of a very old Scotch family whose history goes back to the thirteenth century. He was born at Long Calderwood, a small estate near Glasgow. The house bears a tablet to the effect that he was born on February 13th, 1728. He himself observed the 14th as his birthday, and that is the day of the Hunterian oration at the Royal College of Surgeons. Probably he was born so late at night that they failed to notice whether he appeared just before or shortly after the clock struck twelve.

John was the last of ten children. The first three died in childhood; four others in the prime of life. James, the first son to grow up, died of phthisis at the age of twenty-nine. He was handsome and clever, and William Hunter used to say that he was the brightest of the family and if he had lived nothing could have prevented him from being the first physician in London. A sister, Dorothea, married the Rev. James Baillie, afterwards Professor of Divinity at Glasgow, and had three children; Matthew, who became a famous physician in London; Johanna, who was the "Immortal Johanna," one of Sir Walter Scott's closest friends; and Agnes, whose claim to distinction lay in the fact that she lived to the very great age of 100. John's brother William, too, was one of the masters of medicine, and it was he who set John on his way. William started to read for the ministry, but changed his mind. For three years he lived with Cullen at Hamilton, helping with the uphill work of a country practice. In the summer of 1741 he went to London, where he became assistant to Dr. John Douglas. In 1746 he began to lecture on the operations of surgery and on anatomy.

John, throughout his boyhood, was good at games and observant of nature, but idle and ignorant, a great disgrace for a Scotch boy whose father was a gentleman and whose brothers were studying law and medicine. He hated school books. When seventeen years old he spent a

* An address delivered before the Victoria Medical Society, April 20, 1928, on the occasion of the Bicentenary of the birth of John Hunter.

few months in the timber-yard of his brother-in-law at Glasgow, but did not work and soon returned home. At twenty, he wrote to his brother William asking leave to come and work with him.

The two brothers began to work together in September, 1748. Their temperaments were very different. Reynolds has presented William as a fine gentleman, well dressed, carefully posed, his hands delicate, his features regular and remarkably handsome. In notable contrast is Robert Home's portrait of John Hunter in his working dress, a loose dissecting apron with long sleeves, the cuffs turned back, the garment caught about him with a single button. His attitude is clumsy and his features have none of his brother's good looks. They lack the fineness, but the whole face and figure are full of indomitable strength.

Fortune was favouring William. In 1748 he was appointed physician-accoucheur to the Middlesex Hospital, and the next year surgeon-accoucheur to the British Lying-in Hospital. John Hunter was studying anatomy, and for his lighter studies was seeing something of hospital practice. He was demonstrating to the students and doing the rough work, slaving all day, dissecting and putting up specimens. For two years he worked with Cheselden at Chelsea Hospital. In 1751 he became surgeon's pupil at St. Bartholomew's Hospital, under Percival Pott, whose simplicity of treatment and avoidance of officious interference had made him great in surgery. There was little hope of his becoming a member of the staff at St. Bartholomew's, so he later entered himself as surgeon's pupil at St. George's. He went for a time to Oxford, but left in less than two months. For five months he was sole house surgeon at St. George's.

About this time he began to study comparative anatomy, dissecting different animals, noting different forms and arrangements of organs, and observing them alike in health and in disease, in the hope that he might thereby acquire some knowledge of general principles.

His health was not good and in 1760 he was appointed staff-surgeon in the army. The appointment gave him change of work, a voyage, and an abundance of surgery, especially gunshot wounds. In 1761 he went with the fleet to Belle Isle, a small island off the coast of France, and the next year was staff surgeon in the expedition to Portugal.

William Hunter was hard at work in town. He held two hospital appointments; his private practice was one of the largest in London, and he was doing much literary work, but still found time to proclaim and protect his brother's discoveries in anatomy, among these being: the lachrymal ducts and of the tubuli seminiferi in man; those relating to congenital hernia, concerning which there was much controversy with Percival Pott; the absorbent system, a new truth, second only to Harvey's discovery of the circulation of the blood. Over this there was a great deal of dispute with the Monros of Edinburgh as to whom credit was due. Later, when the two brothers separated, a paper which John gave before the Royal Society on the structure of the placenta caused a lengthy dispute between them.

John Hunter returned from the Peninsula and started practice in Golden Square when he was thirty-five years of age. He was only one more surgeon amongst men of greater experience, including, particularly, Percival Pott. He had no hospital appointment and had been away for more than two years. Moreover, his passion for scientific work delayed his success as a surgeon and dominated the opinion which men had of him.

In 1764 he bought two acres of land at Earl's Court, and built himself a small house. Here he kept his animals and experimented on them. It is recorded that he used to wrestle in play every day with a beautiful small bull which he had received from the Queen. On one occasion it got him down and he was saved only by the accidental appearance of a servant who frightened the animal away. Again, two leopards broke from their confinement and got among some dogs, which they immediately attacked. The howling this produced alarmed the whole neighbourhood. Mr. Hunter ran into the yard to see what the matter was, and found one of them getting up the wall to make his escape and the other surrounded by the dogs. He immediately laid hold of them both and carried them back to their den, only later realizing his great danger. It was here, too, that he did many of his dissections and kept many of his specimens, for he was a most assiduous collector. A remarkable instance of this is recorded in connection with the Irish giant, O'Brien. Hunter was very anxious to get the skeleton of the giant and hearing that his health was bad had him followed OBrien, becoming alarmed at this, made arrangements that his body should be watched after death until a lead coffin could be prepared, in which he was to be buried at sea. After O'Brien's death Hunter got in touch in a public house with the men guarding the body and offered a bribe of £50 to be allowed to steal the body. He appeared eager and the watchers gradually increased their demands until they reached £500, which Hunter borrowed and paid them. He carried the body in his own hackney coach to Earl's Court where he himself prepared the skeleton.

In 1767 Hunter was elected a Fellow of the Royal Society, without having submitted to them any of his works. In the same year he ruptured his tendo Achillis by dancing. Following this he made experiments on dogs, dividing the tendons subcutaneously, and afterwards killing the dogs at different periods to observe the process of repair, thus foreshadowing Stromeyer's work in subcutaneous surgery. On September 9, 1768, he was elected surgeon to St. George's Hospital. This election was of infinite value to him, for a surgeon without a hospital is like a gardener without a garden.

The appointment also gave him the right to have house pupils. Soon after this he was made a member of the Corporation of Surgeons. When William Hunter moved from Jermyn Street to Great Windmill Street John took over the lease of his brother's house in Jermyn Street and moved into it from Golden Square, thus acquiring a good house in a fashionable part of London, near the hospital and already known as a doctor's house.

In July, 1771, John Hunter, at the age of forty-three, married Ann Home. The first child was named after his father. Another son and a daughter died in childhood, and there was another daughter, Agnes. The son John went to Cambridge, entered the army and became a colonel. Neither Agnes nor John had any children. Mrs. Hunter was beautiful and clever and took her place high in society. She was the friend of clever people. She wrote "My Mother Bids Me Bind My Hair," and also the words for Haydn's "Creation." In 1772 Mrs. Hunter's young brother, Everard Home, became the house pupil of Hunter, and much of our information about Hunter comes from his writings.

The following year Hunter had his first attack of serious illness. He describes this himself fully, and in the *Lancet* of February 18th, 1928, there is an article by Dr. John A. Ryle suggesting that this illness was due to thrombosis of the coronory artery, with infarct of heart. He was free until 1776 from further attacks and after this had long intervals of freedom, but towards the last had pain every day.

In 1773 he gave his first course of lectures on the Principles of Surgery. The labour of preparing and delivering these magnificent lectures was very heavy. There was nothing like them in London, for their comprehension of the whole circle of the sciences round surgery. The fee for this course of nearly one hundred lectures was four guineas, making the cost to the hearer but ten pence per lecture. In 1776 he was appointed Surgeon-Extraordinary to the King, his brother having been for twelve years already a member of the household. William Hunter died on Sunday, March 30, 1783. In his will he did not so much as mention his brother John, showing the bitterness of their estrangement.

Many of John Hunter's pupils afterwards became famous. Amongst them were Sir Astley Cooper, Abernethy, Physic of Philadelphia, Cline, and Edward Jenner. Many letters from Hunter to Jenner have been published. These all show the intense interest which Hunter took in all kinds of life; cuckoos, hedgehogs, eels, salmon, bats, trees, porpoises; fossils and many other things. There is also a letter written a few months before he died to a friend in Africa, asking about swallows, ostrich eggs, camels, cuckoos, and the like.

In 1783 his lease in Jermyn Street came to an end. His collection had outgrown that building, so Hunter bought the lease of a large house in Leicester Square. He also bought ground behind it, running to what is now Charing Cross Road, and at a cost of about £6000 erected his famous museum. There is a tradition that Stevenson drew from these premises his picture of the house and museum of Dr. Jekyll. From now on his health was bad. He suffered almost daily attacks of pain. Latterly, these were brought on by the slightest exertion. He gave up the use of wine. Earlier, he had been a heavy drinker. About this time Sir Joshua Reynolds painted the portrait of him which is in the possession of the Royal College of Surgeons. Hunter was a bad sitter, but one day he fell into deep thought. Reynolds turned the canvas he was working on upside down and sketched a new head between the legs of the figure he had already painted. On the occasion of each Hunterian Oration this picture is hung opposite the audience and above the orator.

In 1788 Percival Pott died, and Hunter was now undoubtedly the head of his profession. His consultations were more in fashion than any other surgeon's and his range of practice more extensive. The next year Hunter succeeded Mr. Adair as Surgeon-General and Inspector-General. His health became worse and worse. He was growing old, more from illness than from years. He had given up his lecturing, which was carried on by his brother-in-law, Mr. Home. For the first fifteen years following his appointment Hunter worked fairly well with his colleagues at St. George's, but from that time on he began to have disputes with its surgeons, on the ground that they were not doing enough for the pupils of the hospital. In this year, 1783, the proposal was made by Hunter, or at least supported by him, that a medical school should be created, after the model of the Guy's Hospital School, and that each surgeon should give six lectures on surgery. It was not approved by Hunter's colleagues, for reasons which for the most part seem to have been dictated by a feeling of opposition to Hunter, and not by any valid grounds of argument.

In 1793, the year of his death, Hunter declared that the entrance fees of pupils should no longer be divided equally among the surgeons, and that he would keep for himself the fees of those who entered under him. Whether he wanted the money, or whether he thought by this plan to force his colleagues to do more teaching we do not know. The three other surgeons appealed to the Governors, and there was much argument for and against. The Court of Governors decided against Hunter. That autumn two young men came to be admitted to the hospital under him without certificates that they had been "bred up to the profession" and Hunter promised that he would nevertheless ask the Board to let them enter, bringing up their case at the next meeting on Wednesday, October 16th. On the Wednesday morning he saw one of his friends and told him what was to happen at the meeting. He said he was sure there would be a dispute and it would be the death of him. He went into the

workrooms and told his resident pupils some droll stories and left the house in good spirits, whistling a Scotch air. The meeting had already begun when he reached the hospital. He presented the memorial from the young men and spoke on their behalf. One of his colleagues flatly contradicted something he had said. Then came the end. Angina seized him; he turned toward another room to fight out his pain by himself, and Dr. Matthew Baillie followed him. He went a few steps, groaned, and fell into Dr. Robertson's arms and died.

Hunter's work had been multitudinous. He was anatomist, biologist, naturalist, physician, surgeon, and pathologist, all at once and all in the highest degree.

In person he was five feet, two inches high; strongly built, and toward the end of his life somewhat corpulent; his shoulders were broad and high, his neck very short; he was uncommonly strong and active, compactly made, and capable of great bodily exertion. His hair was of a reddish tint, afterward grey, at last white; his eyes were light. He dressed plainly and not always neatly.

In consultation he was deliberate and of many words. With his patients he made no mystery of their cases and enjoyed illustrating them from the natural history of lower forms of life. He was fond of quoting the names of distinguished patients. There are many stories of his generosity. He was especially kind to poor artists and to poor doctors. He loved his home life and liked his friends to call him by his Christian name.

He had a habit of saying, "I cannot tell at present what to recommend. I must think of it." To Astley Cooper, who asked with surprise whether he had not the year before stated an opinion on some point directly at variance with one he had just put forth, he replied, "Very likely I did; I hope I grow wiser every year," and to the same purport he answered another of his pupils who asked whether he had not written so-and-so, "Never ask me what I have said, or what I have written; but if you will ask me what my present opinions are, I will tell you." Again, "You had better not write down that observation, for very likely I shall think differently next year." And, finally, let me remind you that it was Hunter who said, and the saying dominated his whole life, "Don't think. Try."

## LINACRE'S INFLUENCE ON ENGLISH MEDICINE

"Thomas Linacre (1460-1524), the prototype and father of the scholar physicians in this country, exerted a lasting influence on medicine by founding the Royal College of Physicians of London in 1518, and brought the spirit of Greek learning into the intellectual life of the country. By his will he also established lectureships at the two older universities, but unfortunately these did not fulfil the intentions of the pious founder; for example, at St. John's College, Cambridge, the lectureship became a college appointment and largely a sinecure; twenty years ago, however, the character of the office there was changed, and a distinguished leader in medicine was appointed each year. In 1908, as the first lecturer under the new regulations, the late Sir William Osler gave an account of Thomas Linacre's life, of his activities as a medical humanist and a grammarian, and of the history of the Cambridge foundation; in 1913 the late Sir Norman Moore discoursed in his inimitable manner on "The Physician in English History," and on May 5th last Sir George Newman read an essay, both learned and delightful, on Linacre's influence on English medicine, which has just been attractively printed for private circulation as a pamphlet of 37 pages. Though the subject is much the same as Sir William Osler's it is treated on different lines, and the reader realizes that these two scholarly essays are complementary to each other. Going to Italy with a scholastic grounding in the classics, Linacre brought back to England a living comprehension of the service which pure Hellenism could render to English medicine, of the essential importance of Aristotle, and of the necessity of a re-orientation of medical knowledge as transmitted by the Arabs. In conclusion, Sir George Newman points out that, although Linacre and his pupil Sir Thomas More knew that the future well-being of the English nation lay with simple methods of prevention, this practice is still widely disregarded. Readers of the author's book of essays, *The Interpreters of Nature*' published last year, will naturally hope that in its second edition the Linacre Lecture of 1928 will be included".—*Brit. Med. Jour.*, 1928, ii, 25.

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**The Dosage of Drugs.**—In his preface to the new (nineteenth) edition of *The Extra Pharmacopoeia* Dr. W. Harrison Martindale raises an interesting point about the dosage of new drugs. He remarks that in the case of many of the important and powerful drugs that have been introduced in recent years the dose originally recommended has been found by experience to be dangerously high, and he pleads for more care in the application of results derived from animal experiments to the calculation of doses suitable for therapeutic use. This is a very timely warning, and everyone will agree with the opinion of a scientist whom he quotes as saying, that in the case of a new drug "the clinical trial, properly conducted, ought to involve a research as careful and elaborate as the preliminary laboratory demonstration of a promising activity."—*Brit. M. J.*, 1928, ii, 262.

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**An Anticipation of Listerism.**—"It is not necessary, as modern surgeons teach, that pus should be generated in wounds. No error can be greater than this. Such a practice hinders Nature and prevents the agglutination of the wound."—*Theodoric of Bologna, Bishop of Cervia,* (1205-1295).

# Provincial Association Notes

## PROVINCE OF QUEBEC MEDICAL ASSOCIATION

The annual clinical day of the Province of Quebec Medical Association will be held in Sherbrooke, on Tuesday the 18th of September next.

The forenoon will be devoted to clinical and scientific work; the afternoon to social functions.

A special committee has been appointed to entertain visiting ladies who may accompany members.

During the evening there will be a banquet, followed by the annual general meeting of the Association, during which will be discussed subjects of interest to the profession in general.

The registration fee of $2.00 includes membership in the above Association.

PRELIMINARY PROGRAM

8.00 a.m. Clinics in the different hospitals of the city: St. Vincent de Paul General Hospital, King Street (east); Sherbrooke General Hospital, Park Avenue (Tramways of the Park Line); Hôtel-Dieu, Bowen Street (south) (Tramways of the Newington Line).

10.30 a.m. Inscription at the St. Vincent de Paul Hospital; payment of the annual fee to the Province of Quebec Medical Association; admission cards to the night banquet.

11.00 a.m. Lectures in the large Reception Hall of the St. Vincent de Paul Hospital (3rd floor, Administration Building).
Lecturers: Doctor C. Jeannin, Professor at the Medical Faculty of Paris, France, will speak on "Eclampsia."
Doctor F. H. Lahey, Chief of the Lahey Clinic, of Boston, Mass., U.S.A., will speak on "Abdominal surgery and the general practitioner."

1.00 p.m. Luncheon at the St. Vincent de Paul Hospital.

2.00 p.m. Automobile trips to the Little Lake Magog (9 miles from Sherbrooke), and North Hatley (15 miles from Sherbrooke).
Fishing, bathing, golfing, etc., etc.
For the Ladies: Bridge and tea at the "Country Club," organized by Mrs. (Dr.) Gordon Hume, Dr. J. A. Darche, Dr. F. Bertrand, Dr. J. A. C. Ethier, Dr. H. C. Cabana.

6.00 p.m. Automobile tour of the city.

7.00 p.m. Banquet at the Magog House, Dufferin Avenue.
Orators: Doctor C. F. Martin, Dean of the Medical Faculty of McGill University, Montreal.
Doctor L. de L. Harwood, Dean of the Medical Faculty of Montreal University, Montreal.
President: Doctor Gordon Hume.

9.00 p.m. General meeting in the Magog House Lobby or at the City Hall.

To be discussed: Bill of the Canadian College of Surgeons and Physicians; Health certificate before marriage; Workmen's Compensation Act of the Province of Quebec, etc., etc.
All members of the Province of Quebec Medical Association can join in the discussion.

10.30 p.m. Annual reports of the Secretary and Treasurer, with remarks by the General President, Doctor Stevenson of Quebec City.
Elections.

11.00 p.m. Smoking (Grill Room of the Magog House).

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## PRINCE EDWARD ISLAND MEDICAL ASSOCIATION

The annual meeting of the Prince Edward Island Medical Association was held in Charlottetown on July 11th. The morning session began at 10:30, with the President, Dr. J. C. Houston, in the chair.

After the routine business was disposed of, the following communications from the Canadian Medical Association were considered:

1. *Re* Lister Day.

The Prince Edward Island Medical Association will celebrate this event each year in a fitting manner.

2. *Re* Membership Fees.

The Association is favourable to the suggestion that the fees be collected in October instead of January.

3. *Re* Venereal Disease as an impediment to marriage.

After considerable discussion it was decided to refer this matter to the Medical Council of the Province.

Touching reference was made to the death of Dr. James Warburton, who was one of the oldest and most respected physicians of the Province.

Dr. S. R. Jenkins, President of the Canadian Medical Association, congratulated the different committees on their splendid work, and their almost perfect organization, which had as a result the staging of one of the most successful meetings of the Dominion Association.

Regarding the fifty-ninth meeting the writer of these notes has had many letters of appreciation from our guests on that occasion, particularly stressing the wonderful hospitality of our Island people. While all these expressions were satisfying and welcome, one fact stands out prominently, and seems the most important of all, namely, that the work of the committees received the praise of the officers of the Association, who not only expect but demand efficiency when the success of this important meeting is at stake.

The following officers were elected for the ensuing year:—

*President*, Dr. E. E. Sinclair.

*Vice-Presidents*, Drs. Preston McIntyre, J. B. Champion, and James Walsh.

*Treasurer*, Dr. I. J. Yeo.
*Secretary*, Dr. G. F. Dewar.
*Auditors*, Drs. W. McKenzie and G. L. Smith.
*Executive Committee*, Drs. W. J. McMillan, I. F. McNeill, and B. C. Keeping.
*On the Canadian Medical Association Council*, Drs. I. J. Yeo, H. D. Johnson, and W. J. McMillan.
*Editorial Board, Canadian Medical Association Journal*, Drs. W. McKenzie and J. A. McPhee.
*Medical Council of Prince Edward Island*, Dr. S. R. Jenkins (Registrar); Dr. I. J. Yeo (President); Dr. G. F. Dewar (Treasurer); Drs. H. D. Johnson, W. J. McMillan, E. T. Tanton, and J. F. McNeill.

### PRESIDENT'S ADDRESS

The President, Dr. J. C. Houston, in delivering the annual address, took as his subject "Examination of the urine and its aid in diagnosis."

He said the examination of urine was not a very pleasing occupation, and the general practitioner is often tempted to be satified with a few easy tests done in a rather careless manner, taking as little time as possible. Very often, if there are no symptoms of disturbed kidney function, he neglects or forgets to ask for even a single specimen, and a twenty-four hour specimen would be far too much trouble.

He emphasized the importance of a routine examination, for in this way many obscure cases can be correctly diagnosed. He instanced a case which had been treated for pulmonary tuberculosis and which, under suitable hospital treatment and careful examination of the urine, turned out to be a case of pus-kidney. Another case was admitted to the hospital with a history of Bright's disease, which on careful examination of the urine, and x-ray, turned out to be a case of calculus in the ureter with a large dilated kidney.

Dr. Houston outlined the method of routine examination of the urine as practised in the Prince Edward Island Hospital, and showed that it must be so exact that any disease which has its origin in the kidney can be eliminated.

One cannot do justice to this excellent paper in a brief synopsis. It was felt by all present the President had chosen a very timely subject for his annual address, one which was of real practical value to the practitioners of the province.

The speakers at the afternoon session were Dr. Grant Campbell, of the Alexandra Hospital, Montreal, and Lecturer in Medicine at McGill University, and Dr. J. R. Goodall, of the Royal Victoria Maternity Hospital, Montreal, and Clinical Professor of Gynæcology and Obstetrics, at McGill University.

Dr. Campbell first considered measles, which next to small-pox is the most infectious of the contagious diseases. He went carefully into every phase of the disease from the incubation period to convalescence, also noting the most serious complications.

He then addressed the meeting on the modern treatment of scarlet fever. He went very minutely into special treatment such as antitoxin, and also spoke of the complications of this important disease. His papers, for which he received the thanks of the Association, were of a very high order.

Dr. Goodall's first address was on pelvic infections, which he divided into two groups: (1) Those independent of pregnancy. (2) Those connected with pregnancy. He went carefully into the causation, course and the most suitable treatment to adopt.

Dr. Goodall next dealt with eclampsia. He explained the preventive treatment for this dread disease; the symptoms, course, and the treatment of the attack were described in detail.

The Association thanked Dr. Goodall for his very instructive papers.

The Prince Edward Island Medical Association appreciates the kindness of the Canadian Medical Association in sending such excellent lecturers to address its meetings.

G. F. DEWAR

## BRITISH COLUMBIA MEDICAL ASSOCIATION

At the first meeting of the new Executive of the British Columbia Medical Association, held after the annual meeting in Victoria, chairmen of standing committees were elected as follows: Dr. M. W. Thomas, Victoria, Legislative Committee; Dr. J. H. MacDermot, Vancouver, Industrial Service Committee; Dr. W. T. Ewing, Vancouver, Constitution and Credentials Committee; Dr. D. G. Perry, Vancouver, Publicity and Educational Committee; Dr. J. W. Arbuckle, Vancouver, Ethics and Discipline Committee.

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"In writing, therefore, such a natural history of diseases, every merely philosophical hypothesis should be set aside and the manifest and natural phenomena, however minute, should be noted with the utmost exactness. The usefulness of this procedure cannot be easily overrated, as compared with the subtle enquiries and trifling notions of modern writers, for can there be a shorter, or indeed any other way of coming at the morbific causes, or discovering the causative indications, than by a certain perception of the peculiar? By these steps and helps it was that the father of physic, the great Hippocrates, came to excel, his theory being no more than an exact description or view of nature. He found that nature alone often terminates disease, and works a cure with a few simple medicines, and often enough with no medicines at all."—*Sydenham* (1624-1689).

# Medico-Legal

## MEDICAL COMMUNICATIONS

We are indebted to the *Manitoba Medical Bulletin,* June, 1928, for the following notes on a Supreme Court decision *re* medical communications:

"In giving judgment in an appeal before the Supreme Court of Canada in February last the Court had to deal with the communication by a physician of information supposed to have been obtained by him under the seal of professional confidence from a patient. The facts were briefly as follows.

Dr. M. in 1924, as assistant chief medical officer of a railway company, was investigating a claim for workmen's compensation by H., due to an attack of iritis which permanently affected H.'s vision. In 1920 H. had been a patient of Dr. M. In the course of his inquiries as such medical officer, Dr. M. wrote, among other things, to another physician referring to H. "He also stated that he had had g.c. infection about 1918." H. brought action for damages for libel against Dr. M. At the trial the judge held that in fact H. had not informed Dr. M. that he had suffered from the malady mentioned. The trial judge's decision was reversed by the Appellate Division and H.'s action was dismissed. On appeal by H. to the Supreme Court of Canada that Court decided in favour of H., and found that there was no adequate ground for disagreeing with the finding of the trial judge, that H.'s account of his interviews with Dr. M. should be accepted and that the entry in Dr. M.'s notes on the subject of g.c. infection was the result of an error."

The following are quotations from the majority judgment of Mr. Justice Duff in the Supreme Court:

'We are not required, for the purposes of this appeal, to attempt to state with any sort of precision the limits of the obligation of secrecy which rests upon the medical practitioner in relation to professional secrets acquired by him in the course of his practise. Nobody would dispute that a secret so acquired is the secret of the patient, and, normally, is under his control, and not under that of the doctor. *Prima facie,* the patient has the right to require that the secret shall not be divulged; and that right is absolute, unless there is some paramount reason which overrides it. Such reasons may arise, no doubt, from the existence of facts which bring into play overpowering considerations connected with public justice; and there may be cases in which reasons connected with the safety of individuals or of the public, physical or moral, would be sufficiently cogent to supersede or qualify the obligations *prima facie* imposed by the confidential relation.

The general duty of medical men to observe secrecy, in relation to information acquired by them confidentially from their patients is subject, no doubt, to some exceptions, which have no operation in the case of solicitors; but the grounds of the legal, social or moral imperatives affecting physicians and surgeons, touching the inviolability of professional confidences, are not, any more than those affecting legal advisers, based exclusively upon the relations between the parties as individuals.

It is, perhaps, not easy to exaggerate the value attached by the community as a whole to the existence of a competently trained and honourable medical profession; and it is just as important that patients, in consulting a physician, shall feel that they may impart the facts touching their bodily health, without fear that their confidence may be abused to their disadvantage.

Considering the present case from all these points of view, I am unable to agree that the duty of a chief medical officer of an industrial concern, for example charged with investigating a claim made by an employee for compensation under the Workmen's Compensation Act, and in preparing the evidence, is so 'situated' that 'it,' to use the language of Blackburn, J., in Davies v. Snead (1), 'becomes right in the interests of society that he should tell,' for the purpose of securing information in preparing his case, the facts he has confidentially ascertained from the claimant as his personal medical adviser; or that he is under a duty recognized by people of 'ordinary intelligence and moral principle,' to divulge such facts without the assent of the patient.

There was no duty resting upon the respondent, and no interest committed to his charge, of sufficient weight and importance to require that the libels in question, involving the disclosure of professional confidences should be protected in the 'general interests of society'."

# Correspondence

## *The Edinburgh Letter*

*(From our own correspondent)*

There has been an alarming increase in sickness and disablement claims in Scotland under the National Health Insurance Act. This is a matter of serious importance to the various Friendly and Approved Societies who have to meet these claims. Each year has been worse than the preceding year. It was thought by many that the large expenditure in 1926 under this heading was due to the effect of the coal strike, and that it was merely a temporary phase, but that explanation is no longer adequate to account for the still rising tide of claims. In 1925, the amount spent upon sickness and disablement benefit was £1,570,000, in 1926 it was £2,020,000. Taking disablement benefit alone, the expenditure in Scotland has practically doubled in the last four years. Sir James Leishman of the Scottish Board of Health, in addressing a conference of members of the Approved Societies in Edinburgh recently, drew attention to these figures. He pointed out the interesting fact that while the bill for disablement benefit is increasing, the figures do not represent a growing decline in the health of the working population. As a matter of fact the health of the community has been good, the death rate of 13.5 per thousand being almost at its lowest. Sir James Leishman suggested that a more probable explanation is that the increase in the sick benefit is to a certain extent due to lax certification by doctors. Most of them no doubt are doing their duty by the Act fairly, but even a small minority of the doctors, particularly in the industrial areas by granting certificates on inadequate grounds can cause a considerable increase in the figures. Sir James mentioned that in Northern Ireland, where experience has also been bad, nine doctors had been put off the panel within the past four months, and he added that it might be that in proved cases of persistent lax certification a like procedure would have to be adopted in Scotland. But the Societies can also help by a more effective supervision of cases, and by greater use of the medical referees. Nobody desires that good claims should be rejected, but, as Sir James Leishman said, the Societies should be careful of doubtful ones, while as trustees they are bound to refuse all bad claims.

"An inquiry into Post-Operative Tetanus, a Report to the Scottish Board of Health by T. J. Mackie, M.D., Professor of Bacteriology in the University of Edinburgh" has just been issued. Dr. Mackie in his conclusions and recommendations says "At the present time there is no control by any health authority over the manufacture of surgical catgut liable to carry dangerous bacterial spores and intended for introduction, sometimes in large quantity, into the tissues. The same control as that now exercised, under the Therapeutic Substances Act, by the Ministry of Health (in England) and the Scottish Board of Health over the manufacture of vaccines, antisera, and certain other biological products, should be applied to catgut; such control would assist and guide manufacturers of surgical catgut in standardizing their methods and safeguarding their products. Under the Act referred to, rigorous sterility tests are demanded in the case of antisera, vaccines, etc.; there is the same need for bacteriological control tests of catgut supplied in sealed tubes and "guaranteed" to be sterile. When catgut is supplied in the form of dry strands these should be free from sporing anærobic bacilli of direct intestinal origin—*e.g.*, *B. Welchii*. At the same time, surgeons and others who undertake the responsibility of preparing these strands for operative use should ensure that their methods of sterilization and technique of manipulation, storage, and distribution are such as to yield a perfectly sterile product."

The 33rd annual meeting of the Church of Scotland Deaconess Hospital (Lady Grisell Baillie Memorial) was held recently. This hospital is situated in the Pleasance, formerly a charming residential area, but now a less salubrious locality. The institution contains 50 beds, and provides treatment for medical, surgical and gynæcological cases. During the past year there has been an increase of 99 in the number of cases treated, and the total of 782 is the largest in the history of the institution. In regard to out-patients the hospital has been overrun. People come from all parts of the city and the neighbouring counties to obtain advice and treatment. The Deaconess Hospital is unique in Scotland, if not in Great Britain, as it is the only hospital administered by a church. It was instituted for the twofold purpose of ministering to the sick and the suffering, and also as a place of training for those women who are going to devote their lives to missionary work in this country and beyond the seas. Both these aims have been amply maintained in the past, and we can still claim that the Deaconess Hospital has a very real and honourable position among the charities in Edinburgh. The hospital has always been fortunate in obtaining the services of some of the most celebrated physi-

cians and surgeons, in Edinburgh. The late Dr. G. A. Gibson, Professors Alexis Thomson and F. D. Boyd, were formerly members of the hospital staff, as was W. T. Ritchie the present professor of medicine in the university.

An extension to the Stornoway Hospital, Lewis, has just been opened. Lewis is the largest and most important of the Outer Hebrides, and together with Harris the population numbers 32,000 people who are scattered over a wide area. Until the advent of the motor car medical practice was undertaken under conditions of great difficulty. To this day the superstitions of a former day still linger in the ministrations of hereditary healers and bone-setters. Until recently the local people looked upon a hospital merely as a place in which to die, and avoided it as sedulously as a prison, an asylum or a morgue. There has been a hospital in Stornoway since 1896. This old hospital was enlarged in 1920 to contain about 20 beds. Owing however to the superstitious dread of the people it was never fully occupied. In 1924 with the financial assistance of the Scottish Board of Health under the Highlands and Islands Medical Service Act, a consulting surgeon was appointed. Recently a further grant has made it possible to enlarge the institution along the most modern lines of diagnosis and treatment. A modern x-ray plant, with a complete apparatus for screening and photographing, has been introduced, as well as a light treatment department, where mercury-vapour lamps for artificial sunlight treatment will be installed. Under the present arrangement the Medical Officer of Health for the island, who lives in Stornoway, acts as an anæsthetist. In 1923 which was the last year in which the old arrangements were in force, less than 100 cases were admitted to the hospital. In 1926 with the enlarged surgical service 375 patients were treated and 350 operations performed. There were also more than one thousand out-patient attendances. Surgery in Lewis may still be said to be in its infancy and conditions are reminiscent of a mainland hospital twenty-five years ago. The people have not yet realized how much can be done by early treatment. Cases of cancer for instance are frequently admitted when all chance of a successful operation is past. The removal of enlarged tonsils and adenoids in children, until recently, was seldom carried out. It is only to-day that complicated midwifery cases are beginning to find their way into hospital. With this new and improved surgical service, the dread of the hospital is becoming completely removed, and the whole medical outlook of the people in the island is being changed.

Mr. A. A. Scot Skirving, C.M.G., has retired from the Staff of the Edinburgh Royal Infirmary. Mr. T. M. Millar, F.R.C.S., has been appointed in his place.

GEORGE GIBSON

23, Cluny Terrace, Edinburgh.

## *The London Letter*

*(From our own correspondent)*

The ninety-sixth annual meeting of the British Medical Association was held in Cardiff during last month and a very large and representative gathering took place. The Association had visited Cardiff forty-three years before, and the President, Sir Ewen Maclean, Professor of Obstetrics and Gynæcology in the Welsh National School of Medicine, in his address recalled some of the work of the Association at and since that meeting in 1885. It is difficult to summarize in a brief paragraph any of the valuable discussions concerned with the organization of the Association or with the various subjects brought up in the scientific sections but two things do stand out by reason of their novelty. In the first place there was a proposal brought forward that the British Medical Assosiation should become a full member of the "Association Professionelle Internationale des Medécins" (A.P.I.M.). The Council had decided against this, but the meeting expressed itself by a majority in favour of supporting such a body and instructed the Council to take the necessary steps. The other subject which roused a great amount of interest concerned the proposed paying centres for infant hygiene. Mothers of the middle and upper classes, it appears, are beginning to look with longing eyes on the care and counsel obtained by their poorer sisters at infant welfare centres and desire a similar sort of clinic for themselves. Those who took part in the discussion seemed very frightened at what appeared to be yet another encroachment upon private practice and the meeting approved of urging mothers of these classes to stick to the family doctor. There are experts who prophecy that a state medical service is not very far distant. The general practitioner, as represented at Cardiff, is going to prove a bit of a difficulty it seems, and it is interesting to speculate whether, in terms of industry, he ought to be nationalized or rationalized.

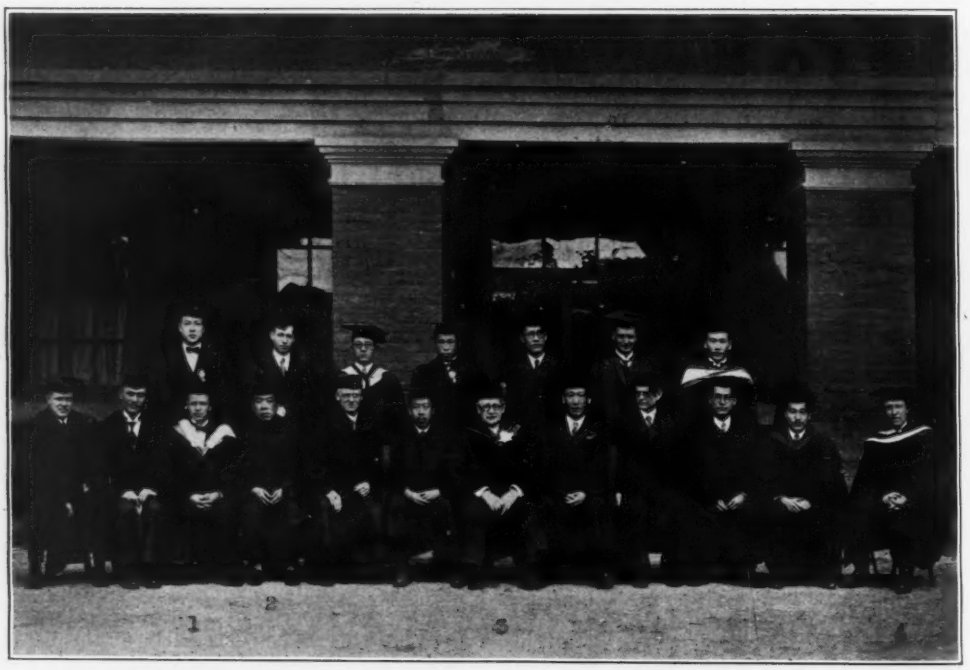
One of the most important international conferences on cancer ever held has just concluded its meetings in London, when delegates from abroad to the number of over one hundred met more than two hundred of their British colleagues. One is constantly being told in the daily press that the solution of the cancer problem is to be obtained by putting a vast number of experts in a position to work uninterruptedly at various parts of the field and then after a period of time pooling their results.

Such a conference as has just been held does in reality represent just such a program as the newspaper writer brings forward as a novel idea. It is not belittling the immense amount of work which the organizers have done, nor the importance of the majority of the discussions held, to say that the problem of the causation of cancer is not much nearer solution as a result. This is not intended as a cynicism; the point is that facts are accumulated almost day by day and what is badly wanted is a fresh interpretation of them. At the conference Dr. J. W. Murphy, of New York, described the results of his recent work which seemed to show that in cancer the "agent" was some endogenous chemical substance rather than an extrinsic living virus. Other speakers also negatived the claims of Gye and Barnard with regard to a cancer virus and yet this was hailed with great shouts only a short time ago. More hopeful were the discussions on treatment and there does now appear to be a well established technique for the use of surgery combined with radium which holds out increasing chances of success. For all that no spectacular advance was announced, the conference was undoubtedly of great value in promoting the interchange of ideas between experts of different countries.

In May, at a "social evening" held at the Royal Society of Medicine, Mr. P. B. Tustin gave an interesting lecture on the production of clean milk and recently the Eighth World's Dairy Congress was held in London, so that milk has certainly been very much before our eyes. The Congress was attended by more than two thousand delegates representing forty-two countries, and considerable interest was shown in the various papers and discussions . The control of the milk supply is a problem which faces many countries; the cost of control, it was generally agreed, should be borne by the state, since, as Sir George Newman put it, the dairying industry is not a trade but a service for health. It is very misleading at the present time to have "Grade A" milk and "Certified" milk both on the market for the public is attracted by the former as being better than the latter. It was strongly urged that all milk, except that from tubercle-free cows, should be pasteurized but the clean milk versus pasteurization controversy still goes on with unabated vigour. The delegates from this country were interested in various figures about the consumption of milk in the form of ice-cream. It appeared that in America in 1926 about three gallons of milk per head of population were consumed under this heading. It is agreed that the milk consumption in the British Isles is much too small, as was emphasized by Mr. Walter Guiness, the Minister for Agriculture, at the opening session, and perhaps it might be increased by such a side-line as ice-cream. Meanwhile a certain chocolate firm is trying to help with its slogan "Eat More Milk."

ALAN MONCRIEFF

London, August, 1928.




**Faculty of the Severance Union Medical College, Seoul, Korea.**
1. Dr. D. B. Avison; 2. Dr. N. Found; 3. Dr. O. R. Avison (President); 4. Dr. S. H. Martin.

*To the Editor:**

I take pleasure in inclosing an article which may be of interest, from which you can take extracts for the *Journal* as it shows some of the work that is being done by Canadian physicians in Korea.

The inclosed photograph of the Faculty has in its group Dr. D. B. Avison of Toronto, son of the President, who is Superintendent of the Hospital, and also Professor of Pædiatrics; Dr. Norman Found, also of Toronto University, head of the Department of Pathology; and Dr. S. H. Martin, Professor of Medicine, a graduate of Queen's University. If you could manage to put in the inclosed photograph, we would greatly appreciate it because of our many friends in the Canadian medical profession.

With all good wishes for the fine work which you are doing,

Sincerely yours,
S. H. MARTIN, M.D.

Seoul, Korea.
April 19, 1928.

* An abstract of the article to which Dr. Martin refers will be found under "General News." The *Journal* is pleased to be remembered so pleasantly by its friends and to form a link of union between the members of the profession in far off lands and their Canadian acquaintances. (ED.).

# Topics of Current Interest

## PROTECTION FROM X-RAYS AND RADIUM EMANATIONS

At the second International Congress of Radiology held in Stockholm in July a series of recommendations by the British X-Ray and Radium Protection Committee, for the protection of workers in Radiology, were unanimously adopted by the delegates of the countries represented. These recommendations are of the greatest importance to every institution in our country that operates an x-ray machine, and should act as a guide in the planning of future installations as well as a check on present faulty installations. This synopsis will include only the most important items, the more technical portions being left for a study by the directors of each department.

Because it is well known that prolonged exposure to x-ray or radium causes definite and permanent injuries to the superficial tissues and derangement of the internal organs and changes in the blood, it is recommended; first, that the working hours of a full-time employee in x-ray departments be limited to seven hours a day for five days a week, the off-days to be spent as much as possible out of doors; second, such workers should have at least one month's holiday a year; thirdly, all x-ray departments should be situated on or above the ground floor level. All rooms, including dark rooms, should have large windows to admit sunshine and sufficient air whenever possible. All rooms should be provided with exhaust ventilations sufficient to change the air ten times an hour. All x-ray rooms should be decorated in light colours. X-ray rooms should have a minimum floor space of two hundred and fifty square feet. Dark rooms should have a minimum of one hundred square feet. Ceilings should be not less than eleven feet high.

The x-ray operator should place himself in a position as remote as practical from the x-ray tube and in the shadow of the target. The x-ray tube should be surrounded as completely as possible with protective material of adequate lead equivalent. In the case of x-ray therapy, the operator should not be in the same room, and should also have a protection of two millimetres lead equivalent. Fluoroscopic screens should have the protection of 1.5 millimetres lead equivalent. Screen examinations should be conducted as rapidly as possible with minimum intensities and small apertures. Fluoroscopic screens should be flanked if necessary by lead impregnated draperies. As a protection against scattered radiation protective gloves should be worn and should be lined with fabric or chamois leather.

The floor of the x-ray room should be a non-conductor of electricity, such as wood, rubber or linoleum. Overhead systems should be coronaless and at least nine feet high. All metal apparatus should be sufficiently earthed.

A. STANLEY KIRKLAND

## DISEASES OF THE CORONARY ARTERIES*

"Sir Thomas Lewis, President of the Medical Section, who took the chair at the opening session of this section, said that the generalization associating a man's age with his arteries should be limited more particularly to the cerebral and coronary vessels. The discussion about to be opened was timely in view of the recent growth in knowledge about this subject, and it might be recalled that rather over a century ago a small group of men in the counties bordering Wales had contributed materially to the little that was then known.

* Abstract of a discussion that took place at the Cardiff meeting of the British Medical Association, July, 1928.

Dr. G. A. Allan, in opening the discussion, said that disease of the coronary arteries had been recognized for a considerable time, and its association with angina pectoris had been widely accepted. In recent years prominence had been given to certain anginoid symptoms which had been found associated with coronary blockage, usually thrombosis. In this country the papers by McNee and by Gibson had helped to focus attention on the subject, but Lindsay Steven had made a careful analysis of the literature as far back as 1887. Coincident with this increased attention to the clinical aspect important anatomical investigations had been made by Gross and his collaborators; in addition to making an accurate survey of the part of the heart supplied by each coronary artery he had also shown that the heart was perhaps the richest organ in the body as regards capillary and precapillary anastomoses between branches of the same artery as well as between branches of both arteries, and that as age advanced there were anastomoses between the vessels in the epicardial fat and adjacent parts and the coronary arteries. The morbid processes affecting the coronary arteries might be classified into four clearly defined conditions. (1) Atheroma, the commonest primary lesion, was a patchy disease first affecting the deeper layers of the intima with degeneration of the deeper parts, proliferation of the fibrous elements, and encroachment on the lumen of the vessel. It was quite irregular in its distribution through the body, and might be well marked in the coronary vessels when there was no indication of it in the accessible arteries. (2) Arteriosclerosis, a diffuse process characterized by thickening of media and intima, probably beginning as a hyperplasia in the media; it was much more uniform in its distribution than atheroma. (3) Syphilis was comparatively rare in the coronary vessels in spite of the fact that aortic syphilis was one of the commonest visceral manifestations of the disease (4) Calcification was most frequently found superimposed on either atheroma or arteriosclerosis; but it might occur as a primary medial degeneration, and its association with atheroma was a potent factor in diminishing the lumen of the vessel. To obtain some idea of the relative frequency of these lesions he had examined the figures collected from 1,000 consecutive autopsies in the Western Infirmary, Glasgow. In these there were 371 cases in which naked-eye lesions had been noted; the lesions were:—

| | | |
|---|---|---|
| Atheroma ..... | 80.6% | with fibrosis in 51.2% |
| Arteriosclerosis .. | 45.3% | with fibrosis in 54.7% |
| Calcification ..... | 10.8% | with fibrosis in 77.5% |
| Syphilis ..... | 3.5% | with fibrosis in 38.0% |

Of 97 cases in which the coronary lesion was noted as producing definite narrowing of the lumen:—

| | |
|---|---|
| Atheroma ..... | was present in 85, with fibrosis in 82% |
| Arteriosclerosis . | was present in 31, with fibrosis in 84% |
| Calcification .... | was present in 33, with fibrosis in 85% |
| Syphilis ..... | was present in 7, with fibrosis in 57% |

Fifty-eight of the patients died suddenly, and in ten of these there was no evidence of fibrosis. Other points which emerged from this study were: (1) severe narrowing of the artery might be present without obvious myocardial lesion; (2) severe old-standing lesion and even occlusion might be present with no clinical history of its occurrence; (3) patients might die with symptoms suggesting coronary occlusion in which no such lesion was found. Disease of the coronary arteries in general tended to produce diminution of the lumen; this caused starvation of the parts supplied, followed by replacement fibrosis, or, if sudden complete occlusion occurred, infarction resulted with subsequent fibrosis. It was apparent that there could be no diagnostic symptomatology to cover all cases of coronary artery disease; in the series quoted 35 per cent of cases showed no gross lesion of the muscle, and of the remaining 238 only 58 patients could be said to have died as the immediate result of the coronary lesions. When the blockage was abrupt certain features were present with such regularity as to make diagnosis reasonably sure; these would be dealt with by subsequent speakers. The features that demanded attention were the duration and situation of the pain, the associated symptoms such as vomiting, collapse, respiratory and mental distress, and such signs as the rate and rhythm of the heart, fall of blood pressure, etc., and the information to be derived from the electrocardiogram. The ultimate prognosis was in almost all cases bad; but judging from old lesions found at necropsy, those who made a good recovery, at least temporarily, must be fairly numerous.

Dr. Carey F. Coombs (Bristol), discussing the etiology of the two great coronary syndromes, ischæmia and infarction, gave an analysis of 1,600 cases of organic heart disease seen during the previous ten years. Both kinds of coronary attack occurred most often in the seventh decade of life, though ischæmia cordis was almost as frequent in the sixth; and appreciable in the fifth, partly owing to its relation to syphilis. Infarction was relatively more common in males than was ischæmia. Dr. Coombs showed a slide indicating that cardiac rheumatism, ulcerative endocarditis, and cardiac syphilis seldom excited the coronary syndromes, except that ischæmia was more frequent in cardiac syphilis in consequence of the liability of the coronary orifices to stenosis in aortic syphilis. Some coronary disorders might, however, be traced to endocarditis lenta, and even a preceding phlebitis.

Dr. Ivor Davies (Cardiff) commented on the importance of symptoms in disease of the coronary arteries, and referred especially to

intermittent peripheral arterial claudication. Coronary sclerosis might be considered as a generic term to include angina pectoris and coronary thrombosis." (*Brit. M. J.*, 1928, ii, 198.)

## EARLY DIAGNOSIS IN MEASLES

"Nearly eight years ago, Brownlee,[1] observing that measles mortality is largely confined to the early age groups, advocated a concentration of effort toward the protection of young children. The idea was revived by Godfrey[2] in this country in 1926. In May of last year, W. S. C. Copeman[3] presented to the Royal Society of Medicine a method of securing this protection by the careful utilization of convalescent serum in patients under 3 years of age, apparently quite unaware that, even as he read his paper, a successful demonstration of something like his scheme was in actual progress in the city of Syracuse, N.Y. Both plans stressed the importance of educational publicity and of conserving the serum for children under 3 years of age. In the Syracuse work Drs. Ruhland and Silverman[4] made an additional point of some importance in stressing the value of early diagnosis. When the serum is given during the first four days after exposure, the proportion of patients who are completely protected is greater than when the serum is given in the second four days. True, the difference is not great and if serum is given in the first week the measles attack will, in any case, be 'modified.' True, also, some authorities believe that it is desirable to modify the attack rather than to prevent it altogether, so as to confer on the patient a more or less lasting immunity. But it must not be forgotten that, as the delay in giving serum increases, so also must the dose increase. The remedy is so precious that this point cannot be overlooked. Early diagnosis means early attention for the patient as well as for the contacts, and this must materially affect the prognosis. As a result of their publicity campaign, calling attention to the possible significance of malaise, slight fever and catarrhal symptoms, Ruhland and Silverman were able to show that in nearly 90 per cent of cases a physician was called on or before the fourth day of illness. Obviously, if physicians are to see patients so frequently in the pre-eruptive stage of the disease, early specific signs become of increasing importance. The appearance of a 'measles line' (a line of congestion across the conjunctiva of the lower lid) shortly after the onset of fever has been described by Stimson.[5] Still more recently, Wadsworth and Misenheimer[6] have reported that, by the use of ultra-violet rays, the rash itself may be detected for from thirty-three to seventy-six hours before it becomes visible by ordinary light. It may be hoped that, as the attention of the pre-eruptive stage, still further aids to confident diagnosis will be forthcoming." *J. Am. M. Ass.*, 1928, xci, 176).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## A TEST FOR PREGNANCY

"All will agree with Dr. A. C. Siddall* that a simple and satisfactory test for the presence or absence of pregnancy would be most valuable, not only to the obstetrician, but also to every general practitioner. He remarks that at present perhaps the best-known test for pregnancy is that of Abderhalden, but he agrees with Smith and Shipley, who tried to bring it within the realm of practicability, and concluded that it is of no value for the diagnosis of pregnancy. He mentions the verdict of De Lee that the epinephrine-glycosuria test, Kammtzer's phloridzin test, the dextrose test, and Fahraens's red blood cell precipitation test are merely of academic interest, and also the statement of Hunt and Long that no laboratory method has yet been devised which is absolutely and infallibly diagnostic of the presence or absence of pregnancy, with the exception of radiological examination in the later months. Experimental work in this field has been hitherto dominated by two ideas—namely, that pregnancy causes a specific protein (ferment) to appear in the maternal blood, and that during the early months of gestation there is a tendency to glycosuria. Siddall suggests a test, however, which is based on a different idea from these. Early in 1926 he advanced the hypothesis that if the enlargement of the uterus and breasts of a pregnant woman is due to the presence of a hormone in the circulation, then corresponding changes should occur in the uterus and breasts of a test animal which had received injections of blood from the pregnant female, whereas the blood from non-pregnant women should give negative results. Binz, in 1924, had observed that, after injecting female mice with the blood of pregnant women, a transverse enlargement of the mouse's uterus resulted, and this result was confirmed towards the end of 1926 by Trivino and Fels. Franck and his co-workers, in a series of papers dating from 1926, have also demonstrated the presence of the female sex hormone

* A. C. Siddall: A Suggested Test for Pregnancy, based on the Action of Gravid Female Blood Serum on Mouse Uterus: Preliminary Report. *J. Am. M. Ass.*, February 4, 1928.

in the circulation, not only during pregnancy, but also during the menstrual periods. These results seem to indicate that the blood of non-pregnant females might also have some effect on the uterus of the test animals. Siddall's observations, however, show that this is so small as not to invalidate his method as a test for pregnancy. His test animals were immature non-castrated virgin female white mice of less than 20,000 mg. weight. One cubic centimetre of the patient's blood serum is injected subcutaneously into an immature virgin white mouse once daily for four or five days. On the sixth day the animal is killed, the weight of the mouse is divided by the weight of the uterus *plus* ovaries, and the resulting ratio provides the criterion for a positive or negative conclusion, a ratio below 400 being positive and a ratio above 400 being negative for pregnancy. Fifty-seven patients were submitted to this test; of twenty-six pregnant patients, twenty-five gave a positive mouse test, while of nineteen non-pregnant patients eighteen gave a negative mouse test, and twelve were incomplete cases. Such evidence requires confirmation in a larger series of patients with controls, and it is to be hoped that further information will be forthcoming." (*Brit. M. J.*, 1928, i, 952).

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## NORMAL WEIGHT AND WORKING EFFICIENCY

By MAY R. MAYERS, M.D.

"The maintenance of a normal weight is one of the best indications of good health. A healthy worker is an efficient worker and one who is less liable to meet with accidents. Have you weighed yourself recently, and compared your weight with the normal weight for your age and height. If not, you should do so at once. Indeed, you should do this every six months at least for your weight is in many ways an excellent indication of your state of health. If you are more than ten pounds heavier than you should be for your age and height you should do something about it—and the sooner the better. Persons who are overweight are more subject to diabetes, kidney trouble, high blood pressure and many other diseases than other people. Also, the necessity for carrying about the excessive weight is a constant and unnecessary strain upon the heart. It is very important that you do not weigh too much.

The very best way to reduce is to get more exercise. This increases the number of calories which your body expends during the day; and frequently if one gets enough exercise, one can reduce without limiting one's diet at all. In order to lose weight, the expenditure of calories by the body must be greater than the number of calories supplied to the body in the form of food. Consequently, in many cases, it is quite sufficient to increase the amount of exercise which one takes, and eat a perfectly normal diet in order to reduce. In the case of those whose work is essentially physical, it is not desirable that the exercise be further increased. Such persons, if they are more than ten pounds overweight should restrict the number of calories in their daily intake of food. They are eating too much *for them*. Each person is a law unto himself. What is too much food for one person may be insufficient for another. Each person must work out the question for himself, and find out what his individual needs in this direction are.

For those who require less food, it is usually best to restrict the number of calories per day to from 1,400 to 1,500. But remember that your diet must at all times be a balanced one. In selecting your day's menu follow the general principles which have already been explained to you. These principles apply quite as well to a reducing diet as they do to a normal diet. You should have plenty of fruit and vegetables. These are relatively low in calories and you can eat a great deal of this type of food without eating too many calories. Have at least two glasses of milk a day, regardless of anything else. These foods will in a general way supply you with all of the salts and vitamines which you require. Then fill in the remainder of your 1,400 or 1,500 calories in any way that you wish. It does not make any difference whether you eat fattening foods like bread and butter and potatoes or not, provided your *total* number of calories is not too high.

Much is said about foods which are fattening and foods which are not fattening. All foods are fattening if you eat too much. No single food will make you fat if the total number of calories in your food for the day is not too high for your personal requirements. One of the greatest dangers of reducing is the fact that when people reduce they usually eat a diet lacking in the important elements—particularly the salts and vitamines. A diet such as suggested above will protect you from committing this mistake. You will reduce on it, but you will feel well at the same time. This is not always the case at the present time with people who are "dieting" to reduce.

Remember also that it is not wise to lose weight too rapidly. You should not lose more than two pounds a week. If you are losing more rapidly, it is a sign that you should eat more. If you are not losing at all on such a regime you should consult a physician. Do not ever take medicine or baths to reduce unless under medical supervision. These may ruin your health. If you do not succeed in reducing on a normal regime your case is one of the exceptional ones. Your glandular make-up is probably responsible. Only a physician can handle your case properly.

The following menus will show you that you can have attractive and inexpensive meals, and plenty to eat, and yet reduce—because you will not be eating more than 1,400 calories of food per day. These menus are merely suggestive, however. You can make up any number of additional ones yourself by putting together 14 or 15 of the 100 calorie portions listed in the *Industrial Hygiene Bulletin* for June, 1926.

**Sample Diets for Reducing**

1,400—1,500 CALORIES

DIET NO. 1

*Breakfast*

| | Number of Calories |
|---|---|
| ½ grapefruit and sugar | 150 |
| 1 roll | 100 |
| 1 pat of butter | 100 |
| Coffee with cream and sugar | 100 |
| *Lunch* | |
| Lettuce and tomato salad | 100 |
| 1 slice of bread | 100 |
| ½ pat of butter | 50 |
| Tea with sugar | 50 |
| *Dinner* | |
| Chicken, small portion | 100 |
| Gravy | 50 |
| Cooked vegetables, average portion | 100 |
| Small potato | 100 |
| 1 slice bread | 100 |
| 1 pat butter | 100 |
| 1 glass of milk | 80 |
| Total | 1380 |

DIET NO. 2

*Breakfast*

| | |
|---|---|
| Juice of one small orange | 70 |
| 1 egg | 100 |
| 1 glass of milk | 80 |
| 1 roll | 100 |
| ½ pat butter | 50 |
| *Lunch* | |
| Cream cheese, 1 tablespoonful | 100 |
| Crackers (3) | 100 |
| Jello (usual portion) | 100 |
| Iced tea with sugar | 50 |
| *Dinner* | |
| Roast lamb, ordinary portion | 200 |
| Small potato | 100 |
| Peas, ordinary portion | 100 |
| Small piece of pie or cake | 100 |
| Fruit, salad, 1 teaspoon French dressing | 150 |
| Coffee with cream and sugar | 100 |
| Total | 1500" |

(*Industrial Hygiene Bulletin*, New York, 1928, iv, 41.)

## PROFESSIONAL DISCIPLINE

"Much interest has been aroused in Alberta in the Professional Discipline Act passed at the recent session of the legislature. Whatever else may be said, it undoubtedly has the distinction of originality, as no similar legislation has probably ever been enacted in any part of the English-speaking world.

The Act sets up a Board, none of the members of which need be a professional man, which has very extensive disciplinary powers over the practitioners of any profession or calling listed in the schedule to the Act. The Board has power to act as a court of appeal from the decisions of the governing bodies of the professions concerned, and has also authority to originate proceedings. It can make its own definitions of professional misconduct and is not to be bound by established rules of evidence. Needless to say, the introduction of the bill caused a storm of protest from the legal, medical and dental professions, all of which passed very strongly worded resolutions denouncing it as an unjustifiable discrimination against the members of the professions concerned. Particular objection was taken to a clause which prevented any appeal to the courts from the decision of the Board. The Government yielded to representations on this point and struck out the section; but when the bill made its final appearance in the House, it was found that the same result had been achieved by adding to another section a few words which declared that the decision of the Board should be final. The schedule to the Act has been left blank, so that up to the present it is inoperative. At any time, however, the Government may, by order-in-council, apply it to any profession or calling it desires.

The consensus of legal opinion in the province is that the legislature, in its desire to put teeth into the act, has over-reached itself and defeated its own ends. One section provides that in all matters within its jurisdiction, the Board shall have all the rights and powers of the Supreme Court of Alberta. It is contended that this constitutes the Board a court and its members judges; and that, as judges can only be appointed by Ottawa, the appointment of the Board by Edmonton is unconstitutional. If the act is brought into operation, this question will doubtless be fought through to the Privy Council.

* * *

The Act described by our correspondent has caused more than a local stir amongst members of professions concerned, and if or when it is applied, it will probably attract even wider notice.

We might add here that there have been no grounds of complaint against professional governing bodies on the score of laxity or excessive leniency. In a remarkably large number of cases handled by them in the past, appeals to the courts have been successful and both doctors and lawyers have felt that the judges have been too lenient. As a result of this, the branches of the Law Society, during the recent session, secured amendments to the Legal Pro-

fession Act, which allow an appeal to the courts from a decision of the branches in matters of discipline only when the branches have not been unanimous. Rightly or wrongly, the feeling does exist that the courts have been too lenient towards offending members of the learned professions." (Supplement to the *McGill News*, 1928, ix, 3.)

# Abstracts from Current Literature

## MEDICINE

**Recent Changes in Our Views Concerning Diseases of the Lungs.** Myers, J. A., *Minn. Med.*, 1928, xi, 465.

The diagnosis of diseases of the chest has undergone many changes in the last few decades, due largely to the aid of the x-ray and the laboratory. In addition to these, however, we have also learnt more regarding physical signs. We now recognize a definite relationship between rigidity or atrophy of the chest muscles and disease of the lungs. The anatomy of the upper part of the chest is being taken into account, especially the differences between the two sides as regards the relations of various structures to the apices; the right apex, for example, comes into direct contact with the trachea, whilst on the left side the subclavian artery intervenes. Again, there is usually a slightly heightened percussion note over the right apex because the superior vena cava and right innominate vein lie in front of the medial part of the apex; this also accounts for increased tactile fremitus, increased transmission of whispering and a broncho-vesicular type of breath sounds on this side.

The failure to consider these facts probably accounts for the belief that the right apex is more often affected with tuberculosis than the left; Dr. Myers thinks that if steroscopic films were taken in a sufficiently large series of cases it would be found that one side was not more liable to infection than the other.

Perhaps the most valuable development in auscultatory examination is the method of eliciting râles by having the patient take a deep breath, exhale, and then just at the end of expiration cough and inhale deeply. This will bring out râles which are otherwise not detectable.

The x-ray, amongst its many other advantages, has told us much about the healing of even advanced tuberculosis of which we were formerly ignorant. It also has shown us that definite areas of pneumonia may appear and disappear in a few days without the manifestations on which we are apt to become dependent. The x-ray examination in Dr. Myer's opinion "must be regarded as part of the general examination and as such we are compelled to recognize it as second only to the finding of tubercle bacilli." It is indispensable in the diagnosis of tuberculosis of the tracheo-bronchial glands in children.

On the laboratory side we have learnt that there are numerous non-pathogenic acid-fast bacilli which may be mistaken for tubercle bacilli. One negative sputum examination means nothing; the bacilli may be found after fifty successive negative examinations. It must be remembered that much sputum may be swallowed, especially in the case of women and children, and the stomach contents and stools should therefore be examined also. Injection of a guinea-pig should be resorted to on occasion. Other pathogenic organisms should always be sought for as well.

Some obscure cases may be immediately cleared up by a bronchoscopic examination; such, for instance, as small tumours projecting into a bronchus, stenosis of the bronchus, and foreign objects not detected by the x-ray. Then the injection of iodized oil has come to the front both for diagnosis and treatment. There are signs that a more balanced view is being taken regarding its employment, particularly since it has been shown that the oil may remain in the lung over long periods.

Perhaps the greatest number of mistakes in diagnosis of pulmonary disease are due to our not making careful systematic examinations on all patients, no matter how trifling the symptoms may be . And yet it is the patient whose disease is soonest detected in whom treatment is most effective.

H. E. MACDERMOT

**Post Encephalitis and Its Problems.** Parsons, A. C., *Proc. Roy. Soc. Med.*, 1928, xxi, 8.

It is only ten years ago that encephalitis lethargica began to be recognized in Great Britain as an inflammatory disease of the brain, sometimes acute, at other times subacute or chronic, prolific in its manifestations, disabling if not fatal in its results, difficult to diagnose and almost defiant as to treatment and prognosis. Something has been learnt of its epidemiology but the way in which it has spread and its relatively high incidence in Great Britain are still unexplained. Its cause is unknown, and attention is now being chiefly focussed upon the consequences and how to deal with those disabled by it, since no effective treatment of the

disease has been discovered. It is true that it accounts for less ill health and disablement among the population than does influenza, for example, or measles, or venereal disease, but in proportion to the few attacked it probably has a higher disablement and death rate than any other disease except cerebro-spinal meningitis. The death rate is calculated to be between 35 and 40 per cent, and as far as can be determined, about 40 per cent of the patients become disabled in some degree.

A broad classification of sufferers from the after effects of encephalitis shows the following three groups: (a) those suffering mainly from physical sequels, such as the very frequent Parkinsonian syndrome; (b) those who chiefly show mental deterioration (and it is probable that the mental processes are affected in all cases, either in the primary attack or subsequently); (c) those exhibiting demoralizations, or changes in conduct, results which are especially common in children.

The problem now is to deal with these disabilities; suitable institutional accommodation must be provided for the progressive physical disabilities (which are often combined with mental failing) and there should be general retraining and education of the youngest children, and training and control of adolescents with serious character changes.

The paper should be referred to for full details of these post-encephalitic disorders and the way in which local administrative bodies have dealt with them in England.

H. E. MACDERMOT

**Bact. Abortus Bang als Erreger septischer Erkrankungen beim Menschen. (Bact. Abortus of Bang as the Cause of Septic Infection in Man.)** Habs, H., *Zeitschr. f. klin. Med.*, 1928, cviii, 445.

The author reports in detail four cases of generalized (septic) infection in man with *Br. Abortus*, in all of which the diagnosis was confirmed by agglutination tests, and in one case by blood culture as well. In the first case the patient was under observation at intervals for six months. The symptoms were inconclusive and the tentative diagnosis was typhoid fever.

In the second case the evidence of severe generalized infection with a subjective sense of well-being, a good general condition, and the experience gained in the first case, aroused the suspicion of *Br. Abortus* infection.

In the third case, there was a long continued fever of intermittent type; the physical examination of the various organs was negative; the blood picture showed a leucocytosis of 7,800 per c.mm., with 46 per cent of lymphocytes; there were no signs of distress even when the temperature was elevated; and the Widal test was negative. All this suggested infection with *Br. Abortus*.

The fourth case showed few physical signs beyond fever of an undulating type, with slight enlargement of the spleen. There was a sense of well-being and a good general condition quite out of proportion to the degree of infection.

The source of infection was not determined, but probably was from milk.

Infection with *Br. Abortus* bears a general resemblance to typhoid fever. The following signs should suggest this diagnosis: a prolonged fever of intermittent or undulant type, an only moderately increased pulse rate, slight splenic tumour, a clear mental state, a normal or diminished leucocyte count with relative lymphocytosis, and a negative Widal test. The diagnosis will be clinched by positive agglutination tests with *Br. Abortus* or by a positive finding in the blood culture.

A. G. NICHOLLS

**Hyperthyroidism and Diabetes.** John, H. J., *Am. J. M. Sc.*, 1928, clxxv, 741.

In a series of 3,335 cases of hyperthyroidism the author found non-physiological hyperglycæmia 285 times. In this series 150 glucose-tolerance tests were done. These varied from normal to those of the most severe type of diabetes. But there is no direct relationship between the glucose tolerance and the degree of hyperthyroidism, therefore the lowered glucose tolerance cannot be due to some toxic effect of the thyroid secretion.

It has been shown that the liver is practically free from glycogen in cases of hyperthyroidism; there must be some interference with the storage of glycogen which is accomplished through the influence of insulin, therefore the lack of glycogen storage indicates a shortage of insulin.

What happens to those patients who show a decreased tolerance? Even after thyroidectomy many of them must follow a dietary regimen, while in others improvement occurs without any dietary observance, but the glucose tolerance curves show that these patients are not normal even after operation. Apparently the damage wrought in the islands of Langerhans is permanent.

LILLIAN A. CHASE

**Diabetes and Hyperthyroidism.** Joslin, E. P., and Lahey, F. H., *Am. J. M. Sc.*, 1928, clxxvi, 1.

The similarity between severe, untreated diabetes and hyperthyroidism is shown by the loss of weight, red cheeks, high metabolism, increased pulse rate, and the weakness rather than strength from the high calories consumed. The series here presented includes 75 cases. Complete recovery has not taken place in any case in this series.

The authors have raised the standard for diagnosis of diabetes in hyperthyroidism to a

blood sugar of 0.15 per cent fasting or 0.20 per cent or more after meals, in addition to glycosuria. The same diabetic family tendency was in evidence as a cause of diabetes in this group as in the conventional diabetes. In 85 per cent of the exophthalmic goitre cases the hyperthyroidism preceded the diabetes.

The authors conclude that surgery greatly ameliorates the condition of these patients; that the treatment of the diabetes in the presence of hyperthyroidism must be adapted to the increased metabolism; and gradual and moderate changes in diet and insulin should be carried out, since the tendency of the ordinary diabetic and the ordinary thyroid case is to do well. The 75 cases were not cured of their diabetes after successful operation on their thyroids but the majority were improved to an unusual degree. The hyperthyroid patient from physiological, pathological, and statistical evidence is somewhat more prone to diabetes than the ordinary individual, and for the remainder of his life should be so regarded, whether operated on or not.

LILLIAN A. CHASE

**Hæmoglobin Construction Within the Body as Influenced by Diet Factors.** Whipple, G. H., *Am. J. M. Sc.*, 1928, clxxv, 721.

Red muscle pigment can be isolated from striated muscle tissue and tested chemically in the living animal. There is biological evidence that muscle hæmoglobin and blood hæmoglobin of the dog are distinct substances, though they are almost indistinguishable by modern methods of examination. As a general rule the content of muscle hæmoglobin in striated muscle depends largely on work demand and exercise.

Short anæmia periods will not show any corresponding change in the level of muscle hæmoglobin. Long continued, severe, experimental anæmia may lower the muscle hæmoglobin which is not subject to rapid fluctuations. Muscle hæmoglobin is influenced by diet, but the change is very slow and cannot be demonstrated in pups with less than fifteen weeks diet control. After fifteen to thirty weeks there is a manifest difference in the pup fed standard bread and the litter mate fed standard bread plus equal parts of cooked liver.

Breadstuffs and the common grains as well as dairy products are least potent of any diet factors, as measured by their capacity to promote hæmoglobin regeneration in the normal anæmic dog. Skeletal muscle varies widely in its capacity to produce new hæmoglobin. Heart muscle as a whole is a little more potent than skeletal muscle; chicken gizzard is potent. Fish is as unregenerative of hæmoglobin as bread and milk. The green, leafy vegetables are popularly overrated. They have little power to help in forming hæmoglobin.

Liver is at the top of the list of favourable diet factors. Kidney stands next to liver. Hæmoglobin set free in the blood stream will not escape through the kidney until a certain concentration of hæmoglobin in the blood stream is reached.

Bone marrow, spleen, brain, and pancreas are rated about the same. They are one-third to one-quarter as potent as liver. Fruits are of extraordinary interest, because some of them are quite potent and others inert. Apricots are high and raspberries are low.

Iron by mouth will produce a favourable reaction if there exists an iron shortage in the body, but iron plus liver gave the expected liver reaction superimposed on the iron reaction. During periods of rapid growth the anæmic dog will show a decrease of hæmoglobin production.

In the study of anæmias attention has been focused on hypothetical toxins which were supposed to destroy red cells *in vivo* and thus bring about anæmia. The author's view is that there is a large group of anæmias due to *lack of something*. Is pernicious anæmia due to lack of stroma building material but a great excess of all sorts of pigment and pigment building material? Pernicious anæmia may prove to be a deficiency disease.

LILLIAN A. CHASE

**Fever in Gastric and in Duodenal Ulcer.** Bang, S., *Arch. Int. Med.*, 1928, xli, 808.

The writer states that the presence of fever in cases of peptic ulcer has not received due recognition and that, when described, its occurrence is frequently related to hæmorrhage. He analyses 386 cases and points out that while fever does occur in cases which bleed this relation is not causal. Fever is also present with non-bleeding ulcers, and the presence of large amounts of blood in the gastro-intestinal tract may possibly cause slight elevation of temperature or increase of pre-existing fever, but does not, *per se*, account for the febrile course of 87.5 per cent of his series of peptic ulcer cases. The influence of the grade of anæmia and the "violence" of the hæmorrhage is also discussed, and these are discarded as primary causes of fever.

It is noted that fever is more prone to occur in early, acute, or rapidly progressing ulcers than in older, more chronic lesions. The extent of this fever is shown by charts to vary from 0.8° to 2.2° C. above normal, and in one case to persist as a remittent and intermittent rise for 96 days.

Particular attention is drawn to the work of Askanazy, Konjetzny, and Kalima who have emphasized the acute inflammatory manifestations in and about the gastric and duodenal lesions, and the presence in the ulcer-bearing

areas of a greater or less degree of gastritis which may even precede the actual rupture of the mucosa. From this is drawn the suggestion that local or general gastritis and duodenitis is a frequent concomitant, and possibly precursor, of peptic ulcer, and that during this process a characteristic fever is exhibited.

J. B. Ross

**Treatment of Diphtheria Carriers.** Harvey, W. C., *Lancet*, 1928, ii, 58.

All diphtheria carriers from the Metropolitan Asylums Board Infectious Disease Hospitals were collected in one hospital, and a study made, primarily to ascertain the cause of continued harbouring of infection. All cases had been definite "carriers" for a period of at least twelve weeks, and no case was considered as cured until six cultures taken at weekly intervals showed negative results.

It was found that the diphtheria organism maintained its existence chiefly in those respiratory passages which were the seat of pathological or other abnormal processes, and that the bacilli were saprophytic in the inflammatory products and did not exist in living tissues.

Regarding treatment, the carriers with bacilli in the throat only were cured by tonsillectomy and adenoidectomy in almost 100 per cent of cases, the time of operation being set at six to eight weeks after the onset of disease, earlier than is usually advised. "Nasal carriers" were much more refractory and treatment both more prolonged and less successful. Autogenous vaccine therapy proved disappointing. Nasal douches twice daily gave the best results, in some cases combined with vaccine courses. In all, 78 per cent of cures resulted in nasal carriers.

The antrum of Highmore was suspected in chronic resistant cases, and in two bacilli were recovered from the sinus at operation. X-rays did not help in the diagnosis. Removal of adenoids alone was ineffective in nasal carriers.

The presence of virulent diphtheria bacilli in the ear was found to be uncommon but such cases were most resistant to treatment. Most ear infections were with diphtheroid organisms. The general health of the majority of carriers was excellent and seemed to play a small rôle in treatment. Greatest emphasis is laid upon removal of all collections of purulent and necrotic material in all forms of treatment.

J. B. Ross

**Action Nocive des Vapeurs de .Formol. (Noxious Action of Formalin Vapour).** Sabrazès, J., and Pennanéach, J., *Comptes rend. de séances de biol. de Bordeaux.*, 1928, xeviii, 241.

The authors draw attention to the dangerous action of formalin inhalation and the necessity of protecting exposed persons from its effects, and report the direct proof obtained by them of the toxicity of formalin vapour. They chose the cobra for this purpose and exposed it in a confined atmosphere to formalinized air for one hour daily. Animals so treated died in three months. Control animals were killed the same day and the tissues of both examined. In the exposed cobra, the mucosa of the pituitary was found to be swollen and covered with mucus, and denuded of cilia, and that lining the trachea and bronchi was metaplasic, with vacuolated pyknotic cells and amorphous areas, and the wandering cells, lymphocytes, deep epithelial elements, and cilia absent; collagen and elastic tissue were increased; all vessels greatly engorged; the lungs were congested, œdematous and emphysematous; the liver, spleen and kidneys showed advanced stasis and degeneration. Similar, though less advanced, changes were seen in cobras left in the open air but in which some formalin vapour had been introduced. Further studies are being made on the changes produced by formalin vapour in the blood and hæmopoietic organs.

In view of these facts the authors suggest using, in the colour preservation of specimens, a substitute for Kaiserling solution No. 1 (which contains 15 per cent formalin) of two parts per 1,000 of "chloramine sodique du toluène," and then restoring the colours by passing through alcohol and into Kaiserling's solution No. III. Persons exposed to formol vapour in operating rooms or laboratories should wear a surgical mask which contains a sachet soaked with weak ammonia water, or acid tartrate of ammonia, or, better still, with 8 per cent solution of borax in 10 volumes of water.

M. E. Abbott

**An Ideal Medical Museum.** Delavan, D. B., *Med. J. & Rec.*, June 20, 1928.

This paper is a strong plea for the establishment of a central medical museum on much broader lines than those already existing. Dr. Delavan points out that most medical museums are narrow in scope, and, in the main, are designed to take care of undergraduate instruction. He remarks "we have few medical museums of recognized superiority." Among the three notable exceptions to his general criticism is the Pathological Museum of McGill University. From data that have been accumulated by the International Association of Medical Museums, it appears that the existing museums in Europe devote themselves to one or more of the following departments; anatomy, comparative anatomy, veterinary anatomy, anthropology, biology, bacteriology, physiology, pathology, microscopy, medical chemistry, medicine, historical medicine, materia medica, pharmacology, surgery, and climatology. Dr. Delavan would

like to have an institution that would represent the interests of the special departments of medicine, with departments of historical medicine, preventive medicine, public health, sanitation, hygiene, industrial hygiene, legal medicine, medical education, the public medical museum, and a bureau of general museum information. The writer's vision is that of an institution whose "vast and varied functions and ever expanding possibilities — adequately endowed, housed and equipped and intelligently directed —would create a standard of all things pertaining to the interests which it represents, and it would become in fact the accepted centre of universal medical museum activities."

A. G. NICHOLLS

## SURGERY

**Radiology and Surgery in Cancer of the Breast.** Webster, J. H. D., *Lancet*, 1928, ii, 63.

This is an analysis of 600 cases of breast cancer and 60 cases of chronic mastitis and a plea for the greater use of x-ray and radium therapy combined with the usual surgical procedures. Pre-operative treatment is urged on account of the efficacy of this measure alone in some cases, the destruction of small nests of cancer cells in lymph and blood spaces remote from small growths thus preventing recurrences, and the rendering of border-line cases operable rather than inoperable. Several examples are cited where post-operative radiation has controlled local (scar), axillary and supraclavicular recurrences over a period of years. No difficulties in skin healing or by stimulation of small growths were encountered.

One apparently inoperable case is well eleven years after x-ray therapy alone.

Chronic mastitis showed itself particularly amenable to x-ray treatment, 90 per cent of cases being cured and only one of 60 cases becoming cancerous. It is suggested that many precancerous or early malignant cases would report much earlier if the prospect of operation were not held before them.

The writer urges further investigation into the effect of x-ray sterilization in preventing stimulation of breast growths during menstruation.

He enunciates the axiom that no operations should be performed on "live or unsterilized tumours" and the closer association of surgeons and radiologists is sought in the study and treatment of breast malignancy.

J. B. ROSS

**Complete Transverse Rupture of the Jejunum Without External Wound.** Armstrong, J. R., *Brit. M. J.*, 1928, ii, 1064.

This type of rupture is rarely found without an external wound and recovery is rarer still. In the case reported both these circumstances existed. A man of 46 was admitted with a history of severe abdominal contusion. He was in a state of severe shock and the whole anterior abdominal wall was rigid and motionless, the only external sign of injury being a slight discolouration in the left hypochondrium. There was great tenderness all over the abdomen, with dullness in the flanks. Liver dullness was present.

The abdomen was opened two hours after admission to hospital. No gas escaped from the peritoneum, nor was there any noticeable odour, but there was a large amount of pure blood present. The only injury was a complete transverse rupture of the jejunum about four inches beyond the duodeno-jejunal flexure. This was easily repaired, and the patient eventually made a complete recovery.

It has been shown in a series of cases collected by Massie that the part of the gut most susceptible to injury is the section crossing the vertebral column. In his series, however, most of the lesions were partial and were usually associated with severe injury of the upper abdominal wall.

The chief symptoms are pain, shock and rigidity. Liver dullness is usually absent. The pulse rate is not a good index as to the need for operation which should be performed as soon as possible. The failure of the gastric contents to escape into the peritoneal cavity was due to a spasm of the pylorus following the shock.

H. E. MACDERMOT

## PÆDIATRICS

**Congenital Heart Block.** Aylward, R. D., *Brit. M. J.*, 1928, i, 943.

R. D. Aylward reports two cases of congenital heart block occurring in the same family. A primipara, aged 21, gave birth to a female child who under six years of observation has had a ventricular heart rate of 40 to 60. During the first few years of life the child was slightly cyanosed and lethargic but now appears normal, within the range of ordinary activity.

Two normal male children were subsequently born and during the fourth pregnancy the fetal heart rate was noted to vary from 49 to 60 per minute. At birth the pulsation of the cord was 63, the baby being an apparently normal seven pound infant. There was some cyanosis during the first two weeks but at one month the child's only apparent abnormality was a ventricular rate of 40 with no evidence of other cardiac defect. Neither parent showed any evidence of lues, nor was there any previous cardiac peculiarity in the family. Aylward points out that failure to acquire normal conductivity is developmental and that coincidence is the only apparent cause for the rare occurrence of two cases in the same family.

J. B. ROSS

**Peptic Ulcer in the New-Born.** Nixon, J. A., and Fraser, A. D., *Arch Dis. Child.*, 1928, iii, 15.

Two cases of peptic ulcer in infancy are reported. Both of these patients were girls, one aged eleven weeks and the other nine days, and both presented symptoms of bleeding from the bowel. In the case of the older infant there was a history of loss of weight and pain in the abdomen for about two months. The younger child had been blue for three days before death and had hæmorrhages from the nose and vulva as well. The post mortem showed chronic peptic ulcers in both; in the first the ulcer was on the posterior aspect of the cardiac end of the stomach, extending into the œsophagus and in the other case it was in the duodenum midway between the pylorus and the opening of the common bile duct.

Review of the literature shows that a considerable number of cases in the very young have been reported. Only one other instance of ulceration of the lower end of the œsophagus could be found, however, and that was of an acute nature, whilst in Dr. Nixon's case there were definite signs of its having been present for some time. Cruveilhier records and illustrates three cases of ulceration of the stomach in the new-born; in each of these the ulcers were multiple, and apparently acute in nature. An authoritative review was made later by Landan in his book on "Melæna in the New-born," in which he came to the conclusion that almost all cases of uncomplicated melæna of the new-born depend on round ulcer of the stomach or duodenum, and that these are due to injuries of some kind during birth, especially asphyxia. This latter factor is insisted on by most of the writers on the subject.

The ulceration seems to be associated most constantly with marasmic conditions and should be looked for in such cases.

The diagnosis may be made solely on the melæna, but it is to be borne in mind that bleeding may be absent, as it was in the early stages of Dr. Nixon's case. Marasmus is a frequently associated condition, but would naturally not occur in the youngest. At later ages pain after food may be evident. Vomiting seems usual, either before or after diarrhœa.

Ordinary medical treatment may be sufficient. A definitely proved case is mentioned of a boy who had symptoms for six months after birth, and operation then showed a scarred ulcer in the duodenum.

H. E. MACDERMOT

## THERAPEUTICS

**Bacillus Welchii (Perfringens) Antitoxin—Its Therapeutic Value.** Bower, J. O., and Clark, J., *Am. J. M. Sc.*, 1928, clxxvi, 97.

The investigations described in this paper were undertaken with a view to following up work done by B. W. Williams of London on the value of *B. welchii* antitoxin in the treatment of intestinal obstruction. The use of this serum was based on the fact that *B. welchii* has been found in a large number of acutely inflamed appendices, and Williams drew attention to the close similarity between the symptoms in those suffering from gas gangrene and those with advanced septic peritonitis and intestinal obstruction. Further association between the two is suggested by the fact that *B. welchii* is the only one of the anærobes in the intestine which produces a toxin. It grows best in the lower part of the small intestine, especially if this becomes paralyzed. The acidity of the large bowel and stomach prevent its growth. Clinical evidence of these facts is shown by the delaying of acute toxæmic symptoms in chronic obstruction until the small bowel is involved; whilst organic obstruction of the small bowel is acute from the onset.

Williams was able to recover *B. welchii* from the vomitus in 11 out of 19 cases of acute intestinal obstruction, and in 19 out of 20 cases of advanced intestinal obstruction, but failed to find it in three cases of pyloric obstruction. He also recovered it from the intestine in four cases.

The writers present a series of 25 cases which received antitoxin on account of various acute abdominal conditions, including acute septic diffuse peritonitis with profound toxæmia, intestinal obstruction associated with toxæmia, and borderline cases which were thought to be due to the *B. welchii*. It was felt that the antitoxin was of value in the peritonitis; it was only given to those in whom there was perforation of the appendix with diffuse involvement of the peritoneum. The effect was to reduce restlessness and pain, to diminish the pulse and temperature, and to cause an earlier evacuation of the bowels. The mortality in these severe cases was 19 per cent.

As regards intestinal obstruction, 19 cases were treated with the serum, and the combating of the toxæmia was thereby greatly aided. The mortality in this group was 26.3 per cent which compares favourably with what Deaver calls the "appalling and incriminating figure of about 50 per cent."

The authors have so far been able to isolate the *B. welchii* from the following locations: (1) the vomitus in cases of intestinal obstruction; (2) the contents of a strangulated Meckel's diverticulum; (3) the drainage of a Paul tube in ileostomy cases of intestinal obstruction; (4) gangrenous perforating appendices.

The antitoxin was given intravenously, 40 c.c. of the old unconcentrated and 20 of the new, and this was repeated in eight to twelve hours, either intravenously or intramuscularly. Further

injections were given if the temperature was still high, if the patient was still toxic or if peristalsis had not been resumed. They conclude that there is enough evidence to warrant the use of this serum in cases of acute intestinal obstruction and peritonitis associated with toxæmia.

H. E. MACDERMOT

**Glucose and Insulin in the Treatment of Shock.** Levy, W. E. and Maclean, Henry, *Current Researches in Anæsthesia and Analgesia*, 1928, May-June, p. 161.

In shock the liver tissue is specially affected. There is interference with the metabolism of carbohydrates and with the storage of glycogen. A damaged liver is the prime factor in producing a state of acidosis, a condition in which the fats are not completely burned, as indicated by a low carbon dioxide combining power and the presence of acetone and diacetic acid in the urine. The author in his treatment of shock gives, very slowly, 1,000 c.c. of a 10 per cent glucose solution by intravenous injection. He takes from one and a half to two hours to administer the whole amount. When one-third of the glucose solution has entered the vein he gives one-third of the total estimated dose of insulin subcutaneously. He estimates the dosage of insulin by allowing one unit for each gram of glucose. When the second third of the glucose solution has been given insulin is again injected. The final third of the insulin is given at the end of the injection.

The action of the insulin is probably twofold; first, in permitting the entire consumption in the body, of the glucose (as shown by the absence of sugar and acetone in the urine shortly afterwards) thereby combating the acidosis; second, by enabling the tissues to hold fluids, which otherwise would have been excreted by the kidneys, as a result of their stimulation by free glucose.

W. B. HOWELL

**Treatment of Tuberculous Peritonitis by Ether Anæsthesia.** Savage, W. E., *Current Researches in Anæsthesia and Analgesia*, 1928, May-June, p. 137.

Many theories have been advanced to explain the cure of tuberculous peritonitis after an operation which has consisted in nothing more than opening and closing the abdomen. It occurred to the author that the cure might be due to the anæsthetic. Since March, 1915, he has treated seven cases of tuberculous peritonitis by ether anæsthesia alone. Of this number six recovered and one showed no improvement. The writer attributes the one failure to the fact that the disease had reached the stage of caseation. The tuberculosis having become non-vascular there was no means by which the ether in the blood could reach the foci of the disease.

W. B. HOWELL

# Obituaries

He scarce had need to doff his pride or slough the dross of earth;
E'en as he trod that day to God so walked he from his birth,
In simpleness and gentleness and honour and clean mirth.

Beyond the loom of the last lone star, through open darkness hurled
Farther than rebel comet dared or hiving star swarm swirled,
Sits he with those that praise our God for that they served His world.

## RICHARD BARRINGTON NEVITT

### AN APPRECIATION

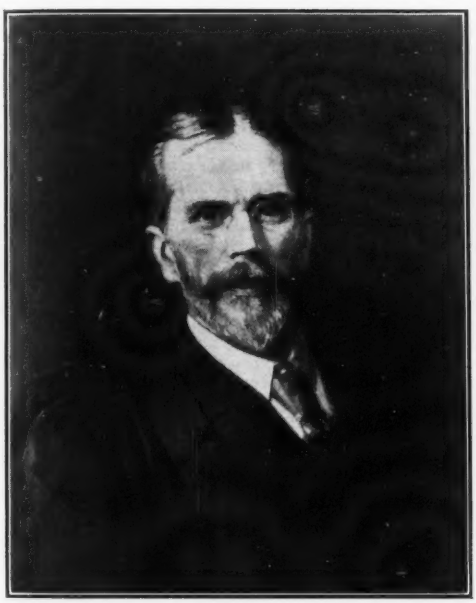
On May 11, 1928, there "went over to the majority" a citizen and a medical practitioner whom the people honoured with one acclaim, and now mourn over as a common loss; a gentleman of the old school, and a dearly beloved doctor, whose like we shall not look upon again. He passed peacefully to his reward sitting in his chair, without sign of suffering or of struggle, his pipe laid carefully down on the table beside him, and his hands folded before him, as sinking to the sleep of the just he "passed to where beyond these voices there is the peace and rest that remaineth."

Born in Savannah, U.S.A., on November 22, 1850, he had completed a little more than half of his seventy-eighth year, and so was ripe for Time's sickle though by no means decrepit in mind or body. Shakespeare has told us that "men must endure their going hence even as their coming hither; ripeness is all." It chanced that he came to "school age," that pregnant time of leisure, in the midst of the fratricidal strife known to history as the "War of the Secession," and was compelled to seek friendly shelter and opportunity of learning within the Canadian border line, and so in 1865 he became a student at Bishop's College, Lennoxville. Here he diligently applied himself to the tasks of peace until he was able in 1868 to matriculate in the University of Trinity College, Toronto. His further progress in that seat of higher learning is sufficiently indicated in this abbreviated form; B.A., 1871; M.B., 1874; M.D., 1882. In the latter half of his medical undergraduateship he lived in the General Hospital; at first as a dresser, then as assistant apothecary, and finally as house surgeon, serving both in-patients and out-patients. This was a clinical opportunity of inestimable advantage, comparable to the old time apprenticeship in making practical practitioners. In the summer or autumn of 1874 he received the appointment of surgeon to the now famous North West Mounted Police, and proceeded to Fort McLeod, by way of Pembina and Winnipeg, one thousand miles on horseback, to join Colonel McLeod, and the incomparable force which he commanded; a force which has covered itself with a cloak of romance, as carrying and dispensing the King's justice "from sea to sea, and from the river (St. Lawrence) to the ends of the earth."

Amid this band of heroes he was no laggard, but did his duty fully with the best. His experience differed somewhat from that of his comrades, for he was ex-

pected to exercise his art among the aborigines whose camps came within his reach. These experiences, as detailed in his diaries, throw much light upon the habits and superstitions of the natural Indian, and would at that time instil into the savage mind new ideas of "the medicine man," so deft was he in many ways and specially in his handling of difficult parturition. Naturally, he worked single-handed and had to fulfil many functions simultaneously, but these poor benighted people were treated with the same consideration and regard as would be manifested in civilized surroundings. He was throughout his life always most modest and retiring, though strong in will and inflexible in purpose.

He returned to Toronto in 1878 and began a civil practice which was only abandoned on the day of his



Richard Barrington Nevitt

death, in obedience to the imperious summons for duty elsewhere; for as Tennyson said of the Iron Duke, "There must be other nobler work to do, than when he fought at Waterloo, and victor he must ever be."

Immediately on returning to practise in this city, he set himself with his accustomed courageous vigour to carve out for himself, without powerful friends and influence, a successful career, and shortly became one of the most widely known practitioners of the city. While cultivating his surgical instincts and proclivities, he carried on for years an obstetric, gynæcological and general practice, which involved, on an average, a birth a day; a performance perhaps only equalled in extent by the records of the elder Dr. James Ross, and Dr. Jerrold Douglas Ball. It is to be noted, however, that these latter did no hospital or teaching work as did Dr. Nevitt so persistently in his long and active association with the House of Providence, the Children's and the General Hospitals, and, more particularly perhaps, with St. Michael's Hospital from its beginning. Dr. Nevitt had a good clinical instinct, a trained mind, and a deft hand. The classic lore acquired at Trinity from the accomplished John Ambery was never laid aside, and many a student has reaped enjoyment from the sowings of that excellent son of Brasenose.

Perhaps the association through which Dr. Nevitt will be longest remembered will be his active connection with the Women's Medical College in Toronto. To Dr. Michael Barrett, of pious memory, the resident medical officer of Upper Canada College, successful teacher there of classics, anatomy, physiology and chemistry, and professor of physiology at the Toronto School of Medicine, is given the credit of establishing this school in 1883. On his first association with the college Dr. Nevitt occupied the Chair of Sanitary Science, but in 1887, after Dr. Barrett's sudden demise, there was a readjustment and Dr. Nevitt assumed the Chair of Surgery. Dr. McPhedran was at the time elected Dean, but retained office for a very short time, and was at once succeeded by Dr. Nevitt, who continued to preside over the destinies of the school until the amalgamation of Trinity with Toronto's medical faculty in 1906, at which time the question of co-education in medicine was also settled. He retired from active teaching life with the disappearance of the Women's College, but retained his interests in the corporation of this institution and also in that of Trinity, and continued his duties at the Women's Hospital and Dispensary while still keeping up his surgeoncy at St. Michael's Hospital.

Dr. Nevitt was a member of the Academy of Medicine from its inception, and a member of the Ontario and Canadian Medical Associations; he was also an active associate of the Toronto Medical Society and of the Library Association. Shortly before his death the Academy made him an honorary member *in perpetuam.*

Dr. Nevitt's father was Mr. John Wilson Nevitt, a merchant of Savannah, and his mother was Miss Mary Tschudi of Alsace and Philadelphia. He married Miss Elizabeth Ellen Beaty, elder daughter of Mr. Robert Beaty of "The Leader," who died about nine months ago.

Doctor and Mrs. Nevitt have left issue surviving them; two sons, Irving H. C. Nevitt and Richard Nevitt; and two daughters, Mrs. George Egerton Ryerson and Mrs. Davidson Black. One son, the Rev. Barrington Nevitt, died in 1918; and another son, Bertram, was killed in action at Courcelette in 1916.

*Requiescent omnes; permultis ille bonis flebilis ultimus occidit. In eternam pacem emigravit.*

IRVING H. CAMERON

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**Dr. C. M. Anderson**, Director of Provincial Laboratories, Department of Health, died suddenly on July 18th, at the summer home of his father-in-law, Mr. James Firth, Burritt's Rapids, Ontario.

Dr. Anderson was in his thirty-ninth year. He was born in Ottawa and received his preparatory education in that city. He graduated from McGill University in 1915 with the degree of M.D., C.M. Immediately following his graduation he engaged in laboratory work at the Royal Victoria Hospital, Montreal, and following this he proceeded overseas as Captain in the Royal Army Medical Corps, where he served with distinction in the Field Ambulance Service. Upon his return to Ottawa he served on the staff of the Department of Soldiers' Civil Reestablishment, and then in 1920 he attended the School of Hygiene at Johns Hopkins University, Baltimore, and received the Diploma of Public Health from this institution.

On the completion of his public health course he was appointed Bacteriologist to the Provincial Department of Health and in this position he so distinguished himself that in 1923 he was appointed Director of Laboratories, succeeding Mr. H. M. Lancaster, who is now Chief Chemist of the Federal Department of Health, Ottawa. Dr. Anderson in his position in the Department of Health was an able administrator and most efficient director, always doing his utmost to give the maximum service to the medical profession and public in the province. He is survived by his wife and two young daughters, now residing in Ottawa.

**Dr. Hector Bonner**, who graduated from Trinity in 1877, died in Toronto late in June. Dr. Bonner had been surgeon in the North West Mounted Police, going to the Yukon in 1897, and while there was successful in locating some valuable claims. Retiring to Toronto, Dr. Bonner began again to practise, though at an advanced age, and for the last eight years he had kept at work until failing health necessitated his going to the Hamilton Sanitarium where he resided until his death. A man of many interests, Dr. Bonner had concerned himself with politics as well as with medicine and prospecting, and had been a Liberal candidate in both the provincial and federal Houses.

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**Dr. Henri Alfred Archambault**, a physician of many years' standing in Montreal, died at his home, 111 Grand Boulevard, Notre Dame de Grace, on July 29, 1928, at the age of 76. Dr. Archambault was born in L'Assomption, and was educated in the local schools and, later, at Victoria College, where he studied medicine. He graduated from this medical school in 1883 and took up the practice of his profession in Montreal. For many years his office was on St. Louis Square. Later, Dr. Archambault was appointed Surgeon-major to the 65th Battalion, and he served with this regiment for a long period. He was also for a time physician to the old Montreal jail, and a great many of the prisoners passed through his hands at various times. Some years ago failing health necessitated his retirement and for the past year he has been seriously ill.

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**Dr. James Stanley Chisholm.** The death of Dr. James Stanley Chisholm, of Mahone, Nova Scotia, occurred at the Homewood Sanitarium, Guelph, Ontario, on the twenty-ninth of July.

Dr. Chisholm had been convalescing from a nervous condition for which he had entered the Sanitarium, and his death was unexpected.

He was a son of Dr. Murdoch Chisholm, of Halifax, who is very well known throughout Canada, and is a Past President of the Canadian Medical Association. After graduation in 1915 the deceased doctor enlisted for overseas service, and, shortly after his return, located at Mahone, where he quickly built up a large general practice, and established himself in the favour of the people.

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**Dr. Wallace A. M. Dinwoody**, one of the most promising of the younger medical men, died in the General Hospital, Toronto, on July 30th, as a result of hæmorrhage from a duodenal ulcer.

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**Dr. J. A. Dufresne** passed away on July 25th, at his residence at Shawinigan. He had been in poor health for the last two years. Born at Deschambault in 1869, he studied at Three Rivers Seminary, Ste. Anne de la Pocatière College, Quebec Little Seminary, and graduated as a physician at Laval University in 1895. He first practised medicine in his home town. In 1901 he moved over to Shawinigan Falls. He took at once a keen interest in the local politics of that newly-born town and was in 1902 elected alderman. He was re-elected in 1904 and 1911. In 1920 he was elected by a large majority as mayor of Shawinigan Falls, and sat for eight years as the first magistrate of that fast-growing city. He retired only in last July, on account of illness. In 1922 he was elected first president of the Union of Canadian Municipalities, and as such the next year presided over its convention at Shawinigan Falls. The city council of Shawinigan Falls voted at a special meeting to give a civic funeral to Dr. Dufresne, as the last tribute of the city whose citizen he has been for eight years.

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**Dr. R. C. Ogilvie**, formerly of Campbellford, Ont., whose death occurred on August 2nd, in Superior, Wis., after a long illness, was a graduate in medicine of the University of Toronto, who practised for some years in Port Hope, Mich., and later retired to enter the lumber business in the west.

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**Dr. Allen B. Earle**, a graduate of Queen's University in 1913, died in Hamilton on July 26th. Dr. Earle served throughout the war in the Canadian Army Medical Corps, doing active front line work and receiving wounds from which he never completely recovered. He had taken post-graduate work in New York and London, and in his years in Hamilton had been devoting himself largely to surgery.

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**Dr. Robert M. Goodwin**, one of the most esteemed of the older practitioners of Manitoba, died very suddenly at his home in Carberry on July 26th. He had seemed to be in his usual health and good spirits on that day, had played a round of golf, and was ministering to a patient when he fell forward and expired almost immediately.

Graduating from Manitoba Medical College in 1894, he practised first in Elkhorn where he enjoyed a large following. Eight years ago he took up farming, but after two years resumed practice at McAuley, and in 1922 he moved to Carberry.

In his younger days he was a prominent athlete. He was a member of the United Church of Canada and was active in his Masonic lodge. He is survived by his widow and four children, one of whom, Dr. Alex. M. Goodwin, is now in Edinburgh doing post-graduate work.

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**Major Joseph W. Hunt, M.B., M.R.C.S., L.R.C.P.** Following an illness of only a few days, Dr. J. W. Hunt, Clinical Specialist in the Division of Preventable Diseases of the Provincial Department of Health, passed away on Tuesday, July 24th, in the Toronto General Hospital, at the age of forty-four years.

Born at Parry Sound and educated in Blind River and Albert College he received his medical degree from the University of Toronto in 1907. Following this he spent a year in London, England, where he continued his medical education and, upon return to Canada, settled in Sault Ste. Marie where he engaged in practice. Upon the outbreak of the War, Dr. Hunt enlisted as medical officer, and served in France with great distinction until the close of hostilities. He was severely wounded during the year 1917. After serving on the medical staff of Christie Street Hospital for a year, he entered the service of the Provincial Department of Health in 1920 as Clinical Specialist, which position he held at the time of his death. His genial personality and unselfishness had made him a great favourite, and his loss will be deeply felt by his colleagues.

He is survived by his mother, Mrs. M. Hunt, and his sister, Miss Annie Hunt, both of Ridgeway, Ont., and his wife and three young children of this city. His burial was with full military honours.

# News Items

## BRITISH EMPIRE

The Council of the College of Surgeons of Australasia has decided to publish a journal. Its object is to assist the college in its aim to advance the science and art of surgery, and to encourage members of the medical profession to become efficient surgeons. It is felt that the publication of the new journal will not interfere with the usefulness of the *Medical Journal of Australia*, and that there will be ample scope for each.

### History of Medicine in Wales

In connection with the recent meeting of the British Medical Association "an interesting little exhibition had been gathered together in the National Museum of Wales at Cardiff for the purpose of illustrating the history of medicine in the Principality, various manuscripts, charms, remedies, and other objects having been selected from the National Library, the National Museum, and the Cardiff Public Library. Specimens of "hydrophobia stones" were shown; these were composed of a kind of alabaster, and scrapings of them were mixed with milk and drunk by those who had been bitten by dogs and cats. The owner of one of these stones knew a man who, after a bite, about the year 1850, "meowed" like a cat, and was not relieved until he had received a dose of the medicine. The "Laws of Hywel Dda," in the tenth century, prescribed the status of the doctor, who was one of the officers of the royal household. He received his linen from the queen and his woollen cloth from the king. He had to attend all within the court gratuitously, except in certain emergencies, for which he received ninepence and his food, together with the "blood-stained clothes" of his patient. His "sarhad" (in English "insult") was six kine and sixpence in silver; his social value was estimated at six score and six kine. One portion of the Laws dealt with the value of the members of the human body. Thus the value of a finger was one cow and twenty pence. The organs of generation were equal to one-half of all the organs, as also was the tongue, which must have rendered computation occasionally difficult after an aggravated assault. The exhibition included the text of the "Meddygon Myddfai," to which the President alluded in his address, containing the medical lore of the twelfth century physicians of Myddfai in Carmarthenshire. A fifteenth century manuscript on vellum consisted of a Latin translation of Almansor, a popular Arabic medical work. The manuscript showed very fine workmanship, being rubricated throughout, and with an illuminated capital letter at the beginning of each of the ten books. In connection with this exhibition at Cardiff it is interesting to note that the directors of the Wellcome Historical Medical Museum have announced the publication shortly of a book on the history and lore of Cymric medicine." (*Brit. M. J.*, 1928, ii, 216).

### Ferrier Memorial Fund

The contributors to the Ferrier Memorial Fund met on July 15th under the chairmanship of Sir Charles Sherrington, and resolved to invite the Royal Society to accept the sum of £1,000 in trust to found a David Ferrier Memorial Lecture. It was further decided that the balance of the fund shall be applied as seems best when the total contributions are known. The fund will be closed on September 30th. The honorary-treasurer is Dr. W. Aldren Turner, 18, Harley Street, W.1.

Emeritus Professor E. M. Crookshank, the eminent bacteriologist, died suddenly recently at Ridge Hill Manor, East Grinstead, in his 70th year. His loss will be severely felt, not only in the medical world, but also in veterinary and agricultural science, to which he devoted the later years of his life.

The youngest son of Captain Chichester Crookshank, at an early age he showed a taste for scientific work. He studied under the late Lord Lister, and in 1882, at the age of 24, was selected for special duty in antiseptic surgery on the staff of Sir James Hanbury, principal medical officer of the Egyptian Expedition. He was present at the battle of Tel-el-Kebir, and received the medal and the Khedive's star for his services. He wrote a report on the antiseptic methods employed at the field and base hospitals of the expedition, and gave valuable evidence before the Royal Commission on the Medical Services in Egypt. In 1886 he was appointed Professor of Bacteriology in King's College, and founded there the first laboratory to be established in England for research and instruction in bacteriology and comparative pathology. He was a skilled hunter of big game, and at his home at East Grinstead were many heads which had fallen to his gun in South Africa and elsewhere.

### The Use of Ethyl Petrol

An interim report of the Departmental Committee on ethyl petrol which has been published, supports the conclusion of the United States Government Committee that there are no reasons for prohibiting the use of ethyl petrol.

The investigations made in America are described in the report, and the committee state that, although there is no evidence to show that the use of ethyl petrol as a motor fuel involves more dangers to health than the use of ordinary petrol, they think, for the time being, the precautions indicated in regulations suggested by the United States Committee are desirable. They also point out that adequate ventilation of all garages, whether ethyl petrol is used or not, is a matter of considerable importance, and that the danger from carbon monoxide in an unventilated garage is very serious.

### The Glasgow Meeting of the British Association

This year's meeting of the British Association for the Advancement of Science will be held in Glasgow, opening on September 5th. The president, Sir William Bragg, will give an address on "Craftsmanship and Science," reviewing in a wide, rather than technical, manner the relations between science and industry. The two evening discourses will be given by Professor E. A. Westermarck on "The Study of Popular Sayings," and by Professor F. G. Donnan, on "The Mystery of Life." Professor Donnan's address will be a study of the present position in biochemical research. Nearly three hundred papers will be presented in the various sections.

Receptions by the Lord Provost and the Corporation will be held in the City Hall, and by the local committee in the Kelvington Art Galleries. Entertainments by public bodies, the Chamber of Commerce, Corporation of Paisley, Royal Faculty of Physician and Surgeons, Platform of the Trades House, Royal Technical College, Institution of Engineers and Shipbuilders, Glasgow and West of Scotland College of Domestic Science, Clyde Navigation Trustees (in connection with their annual inspection of the port and harbour of Glasgow) are also included on the program, in addition to a special service on Sunday, September 9th, in the Cathedral of St. Mungo.

## NOVA SCOTIA

Dr. R. M. Pearce, Director of Medical Education, Rockefeller Foundation, and Dr. D. L. Edsall, Dean of Medicine, Harvard University, were visitors to Halifax early in August. The particular object of their visit was to make a thorough examination of the equipment and teaching facilities of the medical school of Dalhousie University.

Mr. Justice Chisholm has been appointed a member of the Board of Commissioners of the Victoria General Hospital, Halifax, to fill the vacancy caused by the death of Judge Wallace Mr. Justice Chisholm is eminently qualified to serve in this capacity and his appointment has given general satisfaction.

An action for damages to the amount of ten thousand dollars has been brought against the Yarmouth Hospital by a former patient of that institution. The claim is based on the fact that the superintendent of the hospital, a fully qualified nurse, while changing dressings, probed a sinus to the detriment of the patient's condition. The case came up before the July session of the Supreme Court, but only evidence was taken and argument was postponed for a subsequent session of the Court. A number of medical men were called upon for evidence or opinion and considerable difference of opinion was expressed.

Dr. E. W. H. Cruikshank has been appointed to succeed Dr. Boris Babkin as Professor of Physiology at Dalhousie University. Dr. Cruikshank has had a varied experience and is highly recommended, both as a physiologist and a teacher. Dr. Cruikshank followed his studies at the University of Aberdeen, King's College, London, and University College, London. At present he has a teaching position at the Medical College, Tatma, India. Dr. Babkin is spending the summer in Europe but will return in time to take up his new work at McGill University in the autumn.

Dr. G. S. Eadie, of the Department of Physiology, Dalhousie University, has resigned to accept a position at the Johns Hopkins University.

Dr. Mary Stevenson has been appointed assistant to Dr. R. P. Smith, Professor of Pathology at Dalhousie University. She graduated from Glasgow University in 1924. Her technical training was received under Dr. Crappell, Western Infirmary, Glasgow.

Dr. Clyde W. Holland has been appointed to the Chair of Bacteriology, Dalhousie University. Dr. Holland graduated at Dalhousie in 1923, his course having been interrupted by overseas service. Since graduation he has had a varied experience and has shown capacity as a teacher.

Dr. H. L. Scammell, of Pictou, has been appointed assistant resident medical officer at the Victoria General Hospital, Halifax.

The trustees of the Payzant Memorial Hospital, Windsor, N.S., have decided to build an addition which will raise its capacity to fifty beds.

Tenders are being asked for a substantial addition to the Ross Hospital, Sydney.

An investigation into the causation of common colds, which is to be carried on over five years and is being financed by the Chemical Foundation of New York, is to be headed by Dr. James A. Doull, Associate Professor of Epidemiology, Johns Hopkins University School of Hygiene. Dr. Doull is a Nova Scotian and a graduate of Dalhousie.

In order to assure a good representation of Nova Scotia at the Charlottetown meeting of the Canadian Medical Association, it was decided that the annual meeting of the Medical Society of Nova Scotia, which normally would have been held early in July, should be postponed. Inasmuch as this is the year for the seventy-fifth annual meeting of the Society, it was felt that it would be inadvisable to cancel the meeting. Arrangements are now being made to combine three events at Halifax in the month of October, when the seventy-fifth meeting of the Medical Society will be held, when the diamond jubilee of the Dalhousie Medical School will be celebrated, and when the Dalhousie Medical Refresher Course will be put on. The Canadian Medical Association is co-operating actively and the program being arranged will undoubtedly attract a very large attendance. Some very special features are being prepared and it is planned that every province of the Dominion will be represented in the "faculty" of the Refresher Course.

The Dental Society of Nova Scotia held its annual meeting at Halifax in July and was largely attended. Several eminent members of the profession from other provinces and from the United States were present and took part in the program. Dr. J. P. Parker, of Sydney, N.S., was elected President, and Dr. J. Stanley Bagnell, of Halifax, Secretary-Treasurer.

Last winter several cases of typhoid fever developed in the town of Stellarton, and six deaths resulted. Quite recently the husband of a woman who was one of the victims has issued a writ against the town under the Fatal Injuries Act, claiming $15,000 for damages due to the death of his wife. It is alleged that sufficient care was not taken to prevent infection of the town water supply. The action will be tried at the next session of the Supreme Court. It is rumoured that other persons will bring action against the town on the same grounds.

W. H. HATTIE

Following the Canadian Medical Association meeting in Charlottetown, Dr. G. Harvey Agnew, of Toronto, the Associate-Secretary of the Association, visited most of the hospitals in the Maritime Provinces. From Wolfville to Digby local doctors motored him from place to place, so he visited all the hospitals in the valley. The Hospital Section of the Canadian Medical Association promises to be of considerable value to the smaller institutions.

On the evening of July 14th there was an informal reunion of a number of Dalhousie graduates at a dinner in the Isle Royal Hotel, Sydney, which was followed by a social evening at the Cape Breton Yacht Club.

It is announced that Dr. A. M. Marshall, of Halifax, left early in July for the Hawaiian Islands for several months, to be in charge of a local hospital for that time.

Last month we noted that Dr. C. W. Bliss, of Amherst, was the first patient to be operated upon in the temporary quarters occupied by Highland View Hospital after the fire. He is now spending some time convalescing with his son, Dr. Gerald, in Altoona, Pa.

S. L. WALKER

## QUEBEC

The cities of Grand'Mère, Outremont, Westmount, Valleyfield, and Kenogami have registered the lowest infant mortality during the month of May, according to the vital statistics issued by the Provincial Bureau of Health. Everywhere throughout the province there is a favourable decrease in general mortality and infantile mortality as compared with the same months of 1926 and 1927. The highest birthrate for the month is shown by the city of Kenogami.

The number of births in May last in the province were 6,768, as compared with 7,305 in 1926, and 7,796 in 1927. Marriages were 1,345 last May; 1,333 in 1926; and 1,467 in 1927. Deaths at all ages, were 3,003 last May; 3,605 in 1926; and 3,359 in 1927. Infant mortality was 872 in 1928; 1,057 in 1926; and 892 in 1927. It is interesting to note that during the month of May no deaths of children under one year of age were reported in Grand'Mère, Outremont, Westmount, Valleyfield and Kenogami.

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The town of Chicoutimi will be the centre of the sanitary unit for Chicoutimi county, the city council there having unanimously adopted a resolution calling on the Provincial Government to establish one for the county with its headquarters in the city. Chicoutimi is willing to contribute $600.00 per annum towards the unit, the remainder of the necessary amount coming for the different parishes, from the Provincial Government, and the Rockefeller Foundation. The city council of Chicoutimi also suggested that the Government be asked to supply the necessary vaccine to prevent any outbreak of diphtheria.

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A new chapter dealing with laboratory work has been added to the bulletin issued every two months by the Health Department. This shows that this year, so far, this department has made 31 food analyses; 5,262, of milk and cream; 61 examinations for contagious disease; 11, in diphtheria carriers; 42, for drugs; and 6,921 clinical analyses, making a total of 12,328. In milk-inspection work, under the new by-law, there have been 9,190 milk tests taken in various restaurants. Eleven convictions were made in the city; while 6,722 inspections were made in the country, with a total of 56,644 cows, 3,932 stables, 3,263 dairies. Arising out of these, 332 notices were sent and 86 dairies banned.

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Dr. Guillemette, of Baie St. Paul, was elected President of the recently re-organized Medical Society of Charlevoix-Saguenay. Dr. P. E. Paquin was chosen Secretary.

GEORGE HALL

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## ONTARIO

The annual meeting of the Ontario Medical Association for 1929 will be held on May 28th, 29th, 30th and 31st, in the city of Hamilton. The local committee has already held its first meeting for the discussion of preliminary arrangements.

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The annual meetings of the Counsellor Districts of the Ontario Medical Association will be held on the following dates:—

District No. 1, at London, on October 26th.
District No. 2, at Simcoe, on September 26th.
District No. 3, at Owen Sound, on October 10th.
District No. 4, at Hamilton, on October 25th.
District No. 5, at Barrie, on October 3rd.
District No. 6, at Belleville, on September 27th.
District No. 7, at Kingston, on October 31st.
District No. 8, at Ottawa, on October 24th.
District No. 9, at Sudbury, on September 6th, and at Timmins, on October 5th.
District No. 10 at Port Arthur and Fort William, on September 8th.

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On July 10th, the Hastings and Prince Edward County Medical Society met at Madoc. An address was given by Dr. J. K. McGregor of Hamilton on "Indigestion."

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The Renfrew County Medical Society met at Renfrew on July 11th. Dr. J. W. Ross, of Toronto, gave a talk on "Abdominal Pain"; and Dr. Norman B. Gwyn, of Toronto, spoke on "Pneumonia."

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On July 18th, at a meeting of the Northumberland and Durham Medical Society held at Cobourg, Dr. H. S. Hutchison, of Toronto, gave a talk on "Goitre."

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The Bruce County Medical Society met at Kincardine on July 19th, and was visited by Drs. W. P. Tew and J. W. Crane of London. Dr. Tew spoke on "The management of certain obstetrical emergencies"; and Dr. Crane gave a talk on nephritis.

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At a meeting of the Huron County Medical Society, held at Wingham on July 25th, Dr. A. H. W. Caulfeild, of Toronto, gave an address on "Practice and prevention in non-tuberculous pulmonary disease."

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On July 25th, the Lambton County Medical Society met at Sarnia, when Dr. J. W. Ross gave an address on "Abdominal pain."

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Dr. C. H. Best, head of the Department of Physiological Hygiene in the School of Hygiene, University of Toronto, has been awarded the Degree of D.Sc., by the University of London for his research in biochemistry and physiology, carried out at the National Institute for Medical Research, Hampstead.

N. B. GWYN

## MANITOBA

The infant mortality rate, 59 per 1,000 live births, for the first six months of this year, is the lowest ever recorded for the half-year period in the history of Winnipeg.

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The tuberculosis survey carried out in Manitoba by the Health and Hospital Committee of the Welfare Supervision Board has been completed and the records have been turned over to M. P. Morrison, actuary of the Monarch Life Assurance Company, for summarizing. After Mr. Morrison's report is prepared for the Minister of Public Health, Hon. Dr. E. W. Montgomery, legislation aiming at the better care of tuberculous patients and protection of non-affected persons will be drafted for introduction at the next session of the legislature.

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A highly successful meeting of the Brandon and District Medical Association was held at the Manitoba Sanatorium, Ninette, on August 4th. Short addresses were given by members of the staff, Drs. Ross, Scott, Perrin, Mary McKenzie, Bennett, Morgan, Malcolmson, and D. A. Stewart.

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The annual meeting of the Manitoba Medical Association was held on August 10th and 11th. The visiting speakers were: Drs. Alexander Primrose, F. F. Tisdall, and R. R. Graham, of Toronto; and Dr. J. C. Meakins, of Montreal.

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Dr. W. A. Gardner, of Winnipeg, in company with Dr. Hart of Toronto and Dr. Wright of Montreal, gave an illustrated address on fractures before a meeting of the Eastern Saskatchewan Medical Association at Broadview on July 11th.

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Dr. R. W. Jeffrey, of Monroe, Wash., has located at Carberry, Man.

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Dr. A. W. S. Hay is now associated in practice with Drs. N. J. Maclean, P. H. Thorlakson and N. H. Blakie of Winnipeg.

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Dr. C. A. Rice and Dr. S. Kobrinsky have been appointed to the honorary attending staff of Grace Hospital, Winnipeg.

ROSS MITCHELL

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A mosquito prevention campaign was inaugurated this spring, in Winnipeg and its suburbs, by the Winnipeg Health League, and the Young Men's Board of Trade. A fund was raised by popular subscription for this purpose, which was supplemented by a grant from the City Council. Oiling was carried on extensively, measures were taken to drain low-lying land, and holes where water might collect were filled in. Surprisingly good results were obtained, and it is gratifying to be able to report that the mosquito, which in the past has been the most unpleasant feature of the summer in this neighbourhood, has this year been practically absent. The citizens of Winnipeg and suburbs are indebted to the organizers and workers who have brought this condition about.

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## ALBERTA

Advertisements have appeared in certain medical journals in Great Britain regarding vacancies in medical practice in western Canada, and physicians interested have been enquiring through the British Medical Association as to the reasons why these vacancies were not filled by Canadians. In such instances it would seem that the advertisers hoped to secure physicians at reduced rates from Great Britain. Since school inspectors receive $250.00 a month and expenses, Deputy-Ministers $4,500.00 to $5,500.00 a year and Cabinet Ministers $8,000.00 and expenses, one wonders why it is that some communities consider that a medical man should accept $2,500.00 a year and finance his office and the upkeep of his automobile.

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Members of the Alberta Medical Association are anticipating an excellent meeting this year on September 18th, 19th and 20th at Edmonton. A splendid aggregate of the professional staffs of Toronto, McGill and Queen's Universities, as well as others, will be present to give lectures, clinics and speak on special subjects, including: Professor J. C. Meakins, Montreal; Professor A. Primrose, Toronto; Professor Roscoe Graham, Toronto; Professor J. Miller, Kingston; Dr. F. F. Tisdale, Toronto; Dr. G. H. Agnew, Toronto; and Dr. T. C. Routley, General Secretary of the Canadian Medical Association.

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The travelling tonsil clinic of the Provincial Department of Health made the rounds of the Peace River District, following out its usual method of procedure. According to reports most of the work was carried out where there were physicians with established practices, and not in the outlying places as one would have expected would be the case. Many believe that this bargain counter work with bargain counter attention is destined to be a passing affair. Operations are carried out on a cash basis, hence the needy remain away if short of funds, going later to the family physician where they are sure of service, regardless of time, of distance or of remuneration. If the profession in this province is to learn anything from these clinics, it is that the Government approves of the principle of cash for medical services.

The following physicians have recently registered in Alberta: James Ferguson Brunton, Edmonton; Percy Harry Sprague, Calgary; Ernest Aikman Hunt, Calgary; Terence James Agnew, Calgary; Gerard Fordyce Chappelle, Edmonton; Herbert Charles Furst, Strathmore; John Joseph Dobey, Gadsby; Lola D. McLatchie, Calgary; Charles Bramwell Rich, Kitscoty; William Barr Murray, Irma; Edward Alfred Johnson, Edmonton; James E. Patterson, Sarnia, Ont.; W. A. MacDonald, Delia; W. E. Ingram, Calgary; J. D. Matheson, Granum.

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We are pleased to learn that Dr. R. H. O'Callaghan is making a satisfactory recovery from the operation consequent on his serious accident in July. He expects to leave for England shortly.

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Dr. John A. Matheson, a graduate of Toronto University and an interne of the Harper Hospital, Detroit, for the past two years, is now associated with Dr. A. G. Scott, Bassano.

Dr. D. J. M. Crawford, of Red Deer, left recently for Toronto, where he has accepted an internship in the Sick Children's Hospital.

Dr. Charlesworth, of Edmonton, a son of the Deputy-Minister of Public Works, is rapidly regaining his health, following an operation.

Dr. Harry Smith, Superintendent of the Royal Alexandra Hospital, Edmonton, has returned to duty, following an operation for appendicitis.

Dr. J. M. Hotson, a pioneer physician in the Viking district, is now in practice in Vancouver.

Dr. Hector McKenzie, formerly of Milo, has returned from British Columbia and is now acting as locum tenens for Dr. Meyer of Athabasca.

Dr. D. Wannop, of Nanton, has disposed of his practice to Dr. W. E. Tiffin, of Kimberley, B.C., who formerly practised in Alberta. Dr. Wannop will likely return to Southern China, where he had charge of a large hospital prior to the recent revolution.

G. E. LEARMONTH

## BRITISH COLUMBIA

The sixth annual meeting of the Canadian Society for the Study of Diseases of Children was held in Vancouver on June 29th. When one takes into consideration the very tender age of this society and the far-western locale of the meeting, the membership attendance—33 per cent—was indeed excellent. Following as it did on the heels of the midsummer session of the North Pacific Pædiatric Society several men from the adjoining States of Washington and Oregon were enabled to remain over for the meeting.

The sessions were held in the Patricia room of the Hotel Georgia, and opened with the presidential address of Dr. Geo. R. Pirie of Toronto. His remarks, and the paper of Dr. H. P. Wright which followed, dealt with an outbreak of acute intestinal infection in Toronto last year. A very prolonged and excellent discussion on the rational approach to disturbances of nutrition in infancy followed. Dr. F. M. Fry's paper, which was read *in absentia* by Dr. A. P. Hart, dealt with the very pertinent question "What is a pædiatrist" and drew attention to the looseness in spelling this and other medical terms. Dr. Howard Spohn reported a rare case of "Teratoma of the neck" in a boy of five. Dr. Frank H. Boone's paper dealt with "Chronic diffuse nephritis in young children with report of a case." Dr. H. B. Cushing of Montreal, outlined the different types of erysipelas antitoxin. The morning session closed with a paper by Dr. S. G. Ross and Jessie B. Scriver (by invitation) on the "Use of bananas as a food for normal infants and young children."

The afternoon session opened with the showing of a moving picture reel of a case of "Amyotonia congenita" from the Boston Children's Hospital, discussed by Dr. H. P. Wright. Dr. A. P. Hart's paper on Birkhaug's rheumatic toxin brought out the disappointing results obtained in Toronto with the use of this test, which Dr. Birkhaug, said the speaker, appeared to think might be due to a different strain existing in Toronto. Dr. Alan Canfield's talk on "Some observations in child life with special attention to feeding and physique" dealt with the treatment of the type of child to which the speaker gave the name "Underling." "A case of cerebellar abscess" was reported by Dr. Geo. Boyer, in which the apparent impossibility of correct diagnosis had resulted in the death of the patient. Each paper was followed by an excellent discussion. At the business meeting which followed the reading of the scientific papers, the following officers were elected for the coming year: President, Dr. Crossan Clark; Secretary, Dr. Frank H. Boone, both of Hamilton, Ontario. (*Bull. Vancouver Med. Ass.*, 1928, xi, 354.)

Dr. J. W. Arbuckle, of Vancouver, and Dr. J. G. McKay, of New Westminster, conducted the post-graduate tour of Alberta in July, giving lectures and holding meetings under the auspices of the Canadian Medical, Alberta Medical, and British Columbia Medical Associations. They were accompanied by Drs. Geo. R. Pirie, of Toronto, and S. G. Ross, of Montreal. Meetings were held at Medicine Hat, Lethbridge, Calgary, Drumheller, Calgary, Red Deer, Stettler, Camrose, Edmonton, and Vermilion. These doctors were accorded an enthusiastic reception and they report very satisfactory meetings.

Another extra-mural post-graduate tour throughout the province will be carried out jointly by the Canadian Medical and British Columbia Medical Associations in August and September. Arrangements have been completed with Dr. A. T. Bazin, Assistant Professor of Surgery, McGill University; Dr. A. H. Gordon, Associate Professor of Medicine, McGill University; and Dr. Gordon Bates, of Toronto, to give the lectures and clinics. The itinerary will be as follows: August 27th and 28th, Cranbrook; August 28th, Grand Forks; August 30th and 31st, Kelowna; September 4th, Chilliwack; September 5th, Vancouver; September 6th, Nanaimo; September 7th and 8th, Victoria; September 12th, Prince Rupert; September 14th, Prince George. Dr. Theo. H. Lennie, Vice-President of the British Columbia Medical Association, will accompany the speakers from Cranbrook to Vancouver, and Dr. H. Spohn, of Vancouver, will travel to Prince Rupert and Prince George.

The Vancouver Medical Association had the pleasure of hearing an address by Dr. Hilding Berglund, of the University of Minnesota, on his way through Vancouver en route to Peking. Dr. Berglund discussed the most recent work in connection with the anæmias, particularly the results obtained with the liver diet. At the same meeting Dr. Lewis Smith, formerly on the teaching staff of the London Hospital gave an amusing, and at the same time very timely, address on "Mischievous methods in modern medicine."

Dr. H. A. Rawlings, who for the past five years has been in charge of the Rotary Clinic for Diseases of the Chest in Vancouver, is taking up private practice as a radiologist in the city, giving only part of his time to the clinic. Dr. W. H. Hatfield will be associated with Dr. Rawlings as part-time medical officer of the Rotary Clinic from the middle of August.

Dr. H. W. Hill has been appointed one of the Royal Commission to enquire into the milk situation in the Province of British Columbia. The commission has already held a number of sittings as witnesses. For a number of years the milk supply of the City of

Vancouver was supervised by a Milk Commission composed of members appointed by the association.

Dr. D. J. Miller, formerly on the staff of the Workmen's Compensation Board and more recently of Powell River, has taken up practice in North Vancouver.

We very much regret to inform our readers that Mr. C. J. Fletcher, the indefatigable Executive Secretary of the British Columbia Medical Association, is in poor health and will be absent from the office for some months.

Dr. F. Stainsby, formerly of West Vancouver, has left for Mayo, Yukon Territory, where he will engage in practice.

Dr. R. J. Wride, of Atlin, has been appointed Superintendent of the Whitehorse General Hospital.

Dr. G. A. C. Roberts and Mrs. Roberts left last week for Queen Charlotte City, where the doctor intends to practice in future.

Dr. Richard H. Mason, of Clinton, has taken over Dr. E. A. Campbell's practice at Bella Coola, B.C.

J. EWART CAMPBELL

## UNITED STATES

The American College of Surgeons will hold the eighteenth Clinical Congress in Boston, October 8th to 12th. Headquarters will be at the Statler Hotel and the meetings will be held in the ballroom of the Copley-Plaza Hotel and Symphony Hall. The Hospital Standardization Conference will be held in morning and afternoon sessions in the ballroom of the Copley-Plaza Hotel Monday, Tuesday, Wednesday, and Thursday.

An innovation this year will be the commencement of the clinics in the Boston hospitals on Monday afternoon, continuing through the mornings and afternoons of the following four days. Monday evening's program will include an address of welcome by the local chairman; the address of the retiring President, Dr. George David Stewart, New York; the inaugural address of the new President, Dr. Franklin H. Martin, Chicago; and the John B. Murphy Oration on surgery by Professor Vittorio Putti of Bologna, Italy. Tuesday, Wednesday and Thursday evenings' sessions will be held in the ballroom of the Copley-Plaza Hotel. At the Wednesday evening meeting the visiting surgeons will be the guests of the Boston Surgical Society at a special meeting, when the Bigelow medal is to be awarded. On Friday evening, the Annual Convocation of the College will be held in Symphony Hall when the 1928 class of candidates for Fellowship in the College will be received. The Fellowship Address on this evening will be delivered by Dr. William J. Mayo. The annual meeting of the Governors and Fellows will be held Friday afternoon and will be followed by a symposium on Traumatic Surgery, to be participated in by leaders in industry, labour, indemnity organizations, and the medical profession. Ether Day will be celebrated in the Dome Room of the Massachusetts General Hospital on Friday, when a bronze bust of William T. A. Morton will be presented to the hospital. It was in this building that ether was first administered for the production of surgical anæsthesia on October 16, 1846. Several newly completed medical motion pictures, produced under the supervision of the American College of Surgeons and approved by it will, be shown during the Congress.

Reduced fares on the railways of the United States and Canada have been authorized to those holding a convention certificate, so that the total fare for the round trip will be one and one-half the ordinary first class one-way fare. Other outstanding features will be the exhibits. In addition to the commercial exhibits the departments of the College will present scientific exhibits. A number of distinguished foreign guests of international reputation have signified their intention of attending. The Chairman of the Boston Committee on Arrangements is Dr. Frederic J. Cotton.

Considerable interest has been shown by the medical profession throughout the country in the first "Graduate Fortnight" of the New York Academy of Medicine, on the problem of aging and of old age, which is scheduled for October 1st to 14th, with two sessions daily at the Academy, and clinical demonstrations and lectures of thirty teaching hospitals.

Among the speakers to be present from abroad are Sir Farquhar Buzzard, Regius Professor of Physic at Oxford, and Dr. Vittorio Putti, orthopædic physician of Bologna.

Two sessions daily will be held at the Academy, comprising the following program:

October 1st. Afternoon. Opening Session. Introductory Remarks. Dr. Samuel W. Lambert, President, New York Academy of Medicine. Dr. Louis I. Dublin, Statistician Metropolitan Life Insurance Co. The treatment of arthritis deformans of the hip, Professor Vittorio Putti, Institute Rizzoli, Bologna, Italy.

Evening. The doctor—Trainer or healer? Dr. George E. Vincent, President, Rockefeller Foundation. Carpenter Lecture. Pathological processes in aging. Dr. Aldred S. Warthin, Professor of Pathology, University of Michigan.

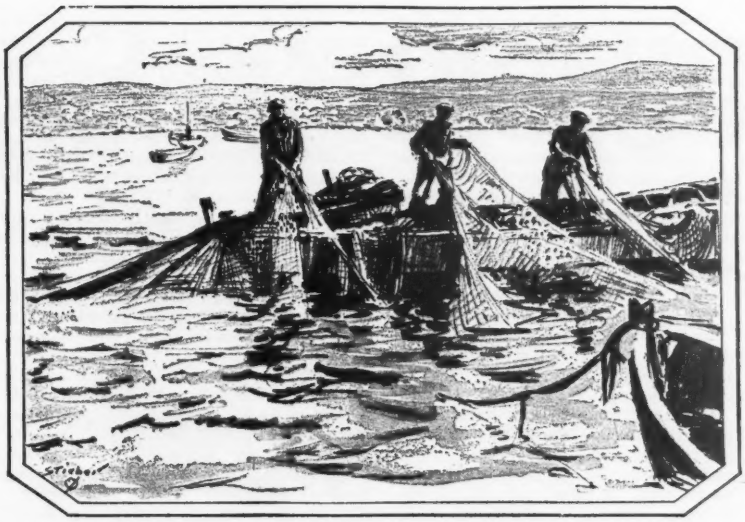
October 2nd. Afternoon. Importance of anatomical pathways in diseases of middle life and old age. Dr. Harrison S. Martland, City Hospital, Newark. Postponement in the individual process of aging. Dr. Linsly R. Williams, President, New York Tuberculosis and Health Association. Clinical aspect and management of old age from the practitioner's point of view. Dr. Charles F. Collins, New York City.

Evening. Syphilis in elderly persons. Dr. George M. MacKee, Professor of Dermatology and Syphilology, Post-Graduate School. Diseases of the skin in old age. Dr. Howard Fox, Professor of Dermatology, New York University.

October 3rd. Afternoon. Arterial diseases of the brain and cord. Dr. Foster Kennedy, Professor of Clinical Neurology, Cornell University. Spinal cord diseases. Dr. Edwin G. Zabriskie, Att. Physician, Neurological Institute.

Evening. The aging of the heart muscle regarded from a general biological point of view. Dr. Alfred E. Cohn, Rockefeller Institute. Dr. Alexis Carrel, Rockefeller Institute. Arteriosclerosis and aneurism. Dr. E. J. G. Beardsley, Associate Professor of Medicine, Jefferson Medical College, Philadelphia.

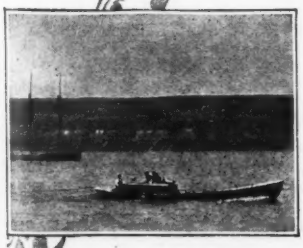
October 4th. Afternoon. Dietetics in old age. Dr. Samuel A. Brown, Professor of Pharmacology, New York University. Pharmacology in old age. Dr. Alexander Lambert, Visiting Physician, Bellevue Hospital. Alcohol in old age. Dr. Samuel W. Lambert, President New York Academy of Medicine.



# *Newfoundland Fisheries···Source of Mead's Standardized Cod Liver Oil*

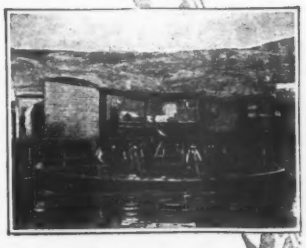
CONTRARY to the practices of other fisheries, the Newfoundland cod is caught in traps set from only one-half to one mile from shore. Only an hour or so of time, often less, elapses after the fish are caught until they are on the landing stages of the Mead Johnson and Co. rendering plants that dot the coast. An hour *or less!* That means fresh livers only are used in the preparation of Mead's Standardized Cod Liver Oil.

Three thousand miles of rocky shore line on the Newfoundland coast afford ideal feeding grounds for the cod. Numerous indentations and small bays abound with caplin and other small fish, constituting the cod's chief food. It is the abundant food supply along the Newfoundland coast that supplies the high vitamin potency of this particular Cod Liver Oil.



## *Newfoundland Cod Liver Oil*

THUS, Newfoundland is particularly well suited for the production of a highly potent cod liver oil. This fact was first established in 1921 and 1922 by the investigations of Mead Johnson and Co. Subsequent researches and comparison with other oils have amply verified these original findings.



**MEAD JOHNSON & CO. *of* CANADA, Ltd.**
BELLEVILLE, ONTARIO

Evening. The relation of disorders of ductless glands to senescence. Dr. William Engelbach, Engelbach Clinic, St. Louis, Missouri. Menopausal and post-menopausal conditions in women. Dr. Benjamin P. Watson, Professor of Obstetrics and Gynæcology, Columbia University. Sir Farquhar Buzzard, Regius Professor of Medicine, Oxford.

October 5th. Afternoon. Gastro-enterological problems. Dr. Arthur F. Chace, Professor of Medicine, Post-Graduate School. Food and food habits. Dr. Solomon Strouse, Associate Professor Medicine, Northwestern University.

Evening. Traumatic surgery and the problems of age. Dr. John J. Moorhead, Professor Traumatic Surgery, Post-Graduate School. Osteomalacia and Paget's disease. Dr. Edwin Allen Locke, Clinical Professor of Medicine, Harvard University. The conditions of the rectum in old age. Dr. Jerome M. Lynch, Professor of Proctology, Polyclinic.

October 8th. Afternoon. Pneumonia in old age. Dr. William R. Williams, Attending Physician, New York Hospital. Bronchitis and asthma. Dr. Frederick T. Lord, Boston.

Evening. Tuberculosis. Dr. Lawrason Brown, Saranac Lake. Climate and the aged. Dr. Gerald B. Webb, Colorado Springs. Psychoses in old age. Dr. Menas S. Gregory, Director of Psychopathology, Bellevue Hospital.

October 9th. Afternoon. X-ray and radium in the problem of old age. Dr. Francis Carter Wood, Director of Radiological Therapeutics, St. Luke's Hospital. Special aspects of neoplasms in the aged. Dr. James Ewing, Professor of Pathology, Cornell University. Diseases of the arteries of the extremities. Dr. Leo Buerger, Attending Surgeon, Bronx Hospital.

Evening. Aging of the human brain. Dr. Frederick Tilney, Professor of Neurology, Columbia University. Apoplexy. Dr. Bernard Sachs, Consulting Neurologist, Mt. Sinai Hospital.

October 10th. Afternoon. Hypertension. Dr. Herman O. Mosenthal, Director of Department of Medicine, Post-Graduate School. Nephritis in old age. Dr. Nellis B. Foster, Associate Professor of Medicine, Cornell University.

Evening. Harvey Lecture. Senescence and rejuvenescence from a biological standpoint. Professor C. M. Child, University of Chicago. Present status of the problem of the so-called rejuvenation. Dr. Charles R. Stockard, Professor of Anatomy, Cornell University.

October 11th. Afternoon. The myocardium. Dr. John Wyckoff, Clinical Professor of Medicine, New York University. Angina pectoris. Dr. Harlow Brooks, Professor Clinical Medicine, New York University.

Evening. Infectious diseases and old age. Arthritis and old age. Dr. Russell L. Cecil, Visiting Physician Bellevue Hospital.

October 12th. Afternoon. Liver and biliary passages. Dr. Franklin W. White, Instructor in Medicine, Harvard University. Digestive problems. Dr. Thomas R. Brown, Associate Professor of Clinical Medicine, Johns Hopkins University.

Evening. Carcinoma of the larynx. Dr. John E. MacKenty, Senior Surgeon, Manhattan Eye, Ear and Throat Hospital. Diseases of the eye in old age. Dr. William H. Wilmer, Professor Ophthalmology, Johns Hopkins University.

Programs of special clinics and clinical demonstrations have been arranged in thirty hospitals which are co-operating in the fortnight.

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The facilities for the study and teaching of medical history at Johns Hopkins University are to be greatly extended. A fund of $2,000,000 is to be expended on an initial building and its endowment. Part of the scheme is the establishment of the Welch Medical Library and Department of Medical History which is intended to foster historical research and provide a cultural background for the medical profession.

Prof. W. H. Welch is now in Europe, collecting medical historical works and other mementoes of interest in connection with the development of the medical profession.

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Mr. Edward B. Bobinette, of Philadelphia, has presented the University of Pennsylvania with a gift of $250,000, for the establishment of a foundation for the study of the prevention of diseases of the cardio-vascular system. It is expected that the fund will eventually reach $1,000,000. Mr. Bobinette also will present at least $500,000 to the University fund for the development of education.

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It has been announced that Mr. Abram E. Fitken, of New York City, has donated $1,000,000 to Yale University, as a memorial of his son. It is intended for the development of the study of diseases of children, and of child life.

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Dr. W. M. L. Coplin, formerly Professor of Pathology at Jefferson Medical College, and author of an outstanding text-book on his subject, died at Atlantic City on May 29th, in his sixty-fourth year.

A graduate of Jefferson in 1886, he became professor of pathology in that institution in 1896; in 1892 was appointed pathologist to the Philadelphia Hospital, a position that he held till his death, and was also President of the Faculty. During the World War he served as a colonel in charge of Base Hospital 38 in France.

Dr. Coplin wrote much on pathology, bacteriology and sanitation, and had an international reputation for his work in preventive medicine.

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## GENERAL

### Second International Congress of Radiology

This year Stockholm entertained the radiologists of the world at the Second International Congress.

Our welcome to Sweden cannot be too heartily stressed, as not only the City of Stockholm but the whole Kingdom of Sweden lavished hospitality on the delegates. The Crown Prince officially opened the Congress in the stately concert hall of Stockholm, and subsequently was an attentive and interested listener on several occasions.

Eight hundred delegates were present, many of whom were accompanied by their families. Noticeable were physicians from as far away as Japan, China and Australia. The United States and Canada were represented by large delegations. The Canadians present were: Drs. W. A. Bauld, Montreal; Gendron, Montreal; C. M. Henry, Regina; A. S. Kirkland, Saint John; McNeill, London; H. MacIntosh, Vancouver; Malcolmson, Edmonton; A. Pirie, Montreal; Prowd, Vancouver; Quint, Calgary.

The first noteworthy feature was the exactness and perfection of the details of the preliminary organization, largely due to the ability and industry of Dr. Axel Renander and his associates. Every visitor to Stockholm will carry always the memory of his experience there as an example of perfect arrangement.

The basis of such perfection was laid three years ago, and the work will be finished this fall in the publication of papers and reports in *Acta Radiologica*.

Entertainment was more lavish than could reasonably have been expected. The King and Queen of Sweden held an afternoon reception for the delegates and their ladies at the Royal Palace. The official delegates were dined by the Corporation of Stockholm in the Town Hall which, by the way, is one of the most magnificent examples of Scandinavian architecture. Many private homes were opened for more personal entertainment. The social side of the Congress was concluded by a dinner and dance at which about twelve hundred people were guests.

The scientific papers will be reported in current x-ray papers and in the various allied publications. It will, therefore, suffice here to say that most valuable contributions to the science of radiology were provided by many speakers from many lands. The official languages were French, German and English.

The exhibition of new equipment was extensive and was housed in the Stockholm Art Gallery. The apparatus included much that was novel, and inspiring impressions were received on how much there was being done by the physicist and engineer in aid of our efforts at diagnosis and therapy. The perfection of the Phillips and Mueller x-ray tube was of interest to all.

Simultaneously with the meetings of the general congress a series of committee meetings were convened dealing with: first, the standard of x-ray protection; second, standards of protection for radium workers; and, third, the adoption of a standard of x-ray dosage. The British committee reported a series of proposals for protection from x-ray and radium emanation which were adopted. The Swedish committee collaborated on the several safeguards for radium workers and their report was also officially adopted. The suggested standardization of x-ray dosage was accepted. The details will be published later.

As Canadians, we returned home satisfied that much of our work is being well done and determined that in other departments improvements are necessary and that new methods will be given a fair trial.

At the Congress it was announced that the King of Sweden had received, on the occasion of his seventieth birthday, a gift of five million Swedish Crowns, as a token from the Swedish public, of their esteem and love for their Sovereign. The King graciously passed this rich gift to the Radium Institute, the Radium Hemmet, to be used for the further investigation and possible cure of cancer.

The rest of the world owes much of the knowledge of radium to the Swedish therapists under the inspired leadership of Dr. Gusta Forsell, who was the President of the Convention just closed.

A. STANLEY KIRKLAND

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### A Gala Day at the Severance Union Medical College, Seoul, Korea

It is not given to many men to see statues of themselves erected during their lifetime. Within the last few weeks this good fortune has come to Marshall Foch. Now we hear of another instance, this time in the case of a man devoted to the arts of peace, Dr. O. R. Avison, President of the Severance Union Medical College.

Dr. Avison was born in Yorkshire, England, sixty-eight years ago. Coming to Canada early in life, he received his education at the high school, Almonte, later taking a teacher's certificate. He graduated from the Ontario School of Pharmacy in 1884 and from the Toronto School of Medicine in 1887. For a time he was on the teaching staff of the Medical Faculty of Toronto University, as well as that of the College of Pharmacy. During the same period he built up a large practice. All this he gave up to become a medical missionary in Korea. In August, 1893, he arrived in Seoul, and took charge of the Royal Korean Hospital, which had been established by the Emperor, and was also appointed physician to the Imperial family.

Returning to America in 1899 he spoke at a Mission Conference in New York on the necessity of establishing a medical school in Korea for the training of native medical men. A man sitting in the balcony of the hall seemed to be paying close attention to what was being said. At the close of the meeting he came to Dr. Avison and asked him if he had his plans for the medical school. Dr. Avison replied that he had. "Then," said the man, "go ahead with them." He was Louis H. Severance. With a gift of $25,000 from Mr. Severance the first hospital building was erected in 1904. In 1909 Mr. Severance donated a further gift of $35,000, to provide a building for the medical school.

In 1917 the medical college was recognized by the government, and in 1923 was further accepted as fully qualified to graduate students in medicine who might practice without other examination by the government.

As the result of another campaign in America in 1924 Dr. Avison was enabled to secure funds for a new hospital, which was erected this year.

Dr. Avison has received many honours at the hands of the Koreans, as well as honorary degrees from Toronto University (M.D.) and Wooster, Ohio (LL.D.).

The twentieth of March, 1928, was signalized in Seoul by a triple event; the unveiling of a statue to Dr. Avison, President of the Severance Union Medical College; the graduation of doctors and nurses from the Medical School, and the opening of the new wing of the hospital. The Severance Compound presented an animated scene when hundreds of relatives and friends of the students and the school came from far and near to attend the exercises.

Dr. S. H. Hong, President of the Alumni, presided at the unveiling ceremony and made a very appreciative speech, in English and Korean. The statue bears the following inscription in English, as well as one in Chinese:—

"O. R. Avison, Pharm.G., M.D., C.M., (University of Toronto, Hon. Causa), L.L.D. Born in England, educated in Canada, Medical Missionary to Korea since 1893 (under the Board of Foreign Missions, Presbyterian Church in U.S.A., but the Servant of all the Missions of the Christian Church); President of Severance Union Medical College, Seoul, Korea. Dr. Avison's Students, the Alumni of Severance Union Medical College, have erected this statue as an expression of their appreciation of his love, of their gratitude for his great work for Korea and of their intention to continue the same kind of service to their people in the Name and Spirit of the Lord Jesus Christ, 1927."

A contratulatory address was delivered by Baron Yun Tchi Ho, which was a gem of humour, pathos, and brevity. It ran as follows:—

"Dr. Hong asks me to make a long English speech and then to translate it into Korean—and all this in three minutes. If I could accomplish all that, as Dr. Hong desires, I should deserve a statue myself.

"Dr. O. R. Avison has done three wonderful things during the thirty-five years past. When he took charge of the Korean Government Hospital, he found in it one patient and forty 'chuses' or officials. We can easily see what a time he must have had in dealing with such a situation. He would probably have found it easier to handle forty patients and one chuse. Out of that unpromising beginning he has literally created this splendid Severance Hospital that we see to-day.

"He started a medical school without text-books, and, worse still, without a vocabularly to convey his ideas. Yet is spite of all these difficulties and discouraging circumstances he has created a medical school which is a prince of its kind, not only in Korea but in all the Far East.

"The third wonderful thing he has done is this; anyone who has accomplished such great tasks may well become famous as Dr. Avison is to-day, but the wonder is how he could have managed to become famous and fat at the same time.

"It was very thoughtful on the part of the Alumni Association of the Severance Medical College to express their appreciation and gratitude in the form of a statue for the man whom they love and honour. Some think it is not quite orthodox to erect a statue for a man while he is living. But orthodoxy or heterodoxy, I think it more rational to strew some flowers on the paths which a man walks on than to heap floral crowns on his coffin.

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"There is one thing I wish the Alumni Association had found feasible to do; that is to have erected another statue by the side of the doctor's for Mrs. O. R. Avison. I suppose they thought it unnecessary since the fact that she has made it possible for the doctor to do his great life work so well, and the fact that she has given two missionary sons to Korea are sufficient memorials for her, better than can be expressed in bronze or marble. I thank you, Dr. and Mrs. Avison, in the name of the Korean people, for the great service you have done for us."

Immediately after this ceremony graduation exercises took place, eight receiving degrees in medicine and three diplomas in nursing. The graduates of the school, since its inception, number 175 in medicine and 77 in nursing.

The new hospital wing, the gift of Mr. J. L. Severance, Mrs. F. P. Prentice, and a few other donors, was then dedicated, and formally opened by Mrs. O. R. Avison.

The gifts of the Severance family to this remarkable college and hospital have amounted to 500,000 yen, in addition to which they contribute about 47,000 yen annually to the budget of the institution.

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### Courses at Paris

The following is the program of the post-graduate courses in medicine that are to be given in English in Paris next autumn, under the auspices of the Dean and the Faculty of Medicine of the University.

#### PROPEDEUTIC MEDICAL CLINIC

October 29th to November 3rd, inclusive.

In the morning practical demonstrations will be given at the bedside, under the guidance of Professor Emile Sergent. The afternoon will be devoted to theoretical instruction.

Dr. F. Bordet; Lipiodol in the diagnosis of diseases of the respiratory tract.

Dr. Oury: Bronchial forms of pulmonary tuberculosis.

Dr. Turpin: Carcinoma of the bronchi.

Dr. Kourilsky: Lung abscess. Bronchiectasis.

Dr. Benda: Bronchial forms of pulmonary syphilis.

Fee: 500 francs.

#### CARDIOLOGY

October 20th to 30th inclusive.

Prof. Antonin Clerc: Coronary obliteration in pathology; Practical demonstrations (clinical, anatomo-pathological, electrocardiographic, etc.); The cardiac complications of pregnancy; Pathological ventricular rhythms; Syndromes referable to the pulmonary artery; Ouabain in cardiac therapeutics.

Fee: 500 francs.

#### PÆDIATRICS

October 8th to 20th, inclusive.

Dr. Weil-Halle: The healthy child. Puericulture and its organization in France; Operation of the School of Puericulture; Feeding of infants; Diet kitchen, practical work; Infantile hypotrophy; Thymus hypertrophy; Vaccination against diphtheria; The so-called acetonæmic vomiting; Bases of vaccination against tuberculosis; Practice of anti-tuberculosis vaccination with B.C.G.

Dr. Armand-Delille: Organization of children's hospitals in Paris; Acute adenoiditis and otitis in infants; Broncho-pneumonia; Pulmonary gangrene; Bronchiectasis; Intratracheal injections of lipiodol, and radiological examinations; Measles and its complications; Early stage of tuberculosis in children; Tuberculous contagion in children; Bacteriological diagnosis of tuberculosis in children; Artificial pneumothorax in children; Local tuberculosis in children, with the value of heliotherapy and actinotherapy; Types of anæmia in infants.

Dr. Pierret: Hydromineral treatment of lymphatic states in children.

Fee: 1,000 francs.

#### SURGERY OF THE DIGESTIVE TRACT AND LIVER

October 15th to 20th.

Professor Antonin Gosset: Duodenal ulcer; Carcinoma of the pylorus; Appendicitis and its complications; Cholecystitis; Gall-stone in the common duct; Surgery of the colon; Clinic with radiographic projection and pathological specimens.

Professor Gosset will also conduct operations and give technical demonstrations on surgical procedure at the Salpetrière.

In the afternoons, at the "Ecole pratique de la Faculté de Médicine," a course in operative surgery will be conducted on the cadaver, under the direction of Dr. Marcel Thalheimer. Each attendant will perform on the cadaver the operations demonstrated the same morning with the technique of Professor Gosset.

Lessons on the anæsthetized dog may take place in the Laboratory of Experimental Surgery, provided the attendance is sufficiently large.

Fee: 500 francs.

#### THE SURGERY OF THE EYE

Drs. Morax, Magitot, Bolack, and Hartmann.

Ten lessons on this subject will be given, beginning on October 2nd, with exercises on the human cadaver and pig's eyes. Each attendant will perform the operations. Only a limited number can be accepted. These lessons will be given every other day; lessons in Oto-rhino-laryngology will be given on the intervening days.

Fee: 500 francs.

#### THE SURGERY OF THE EAR, NOSE, AND THROAT

Professor F. Lemaitre; Drs. Aubin, Maduro, and Remy-Neris.

These lessons will begin on October 3rd, and each attendant will have opportunity to perform operations on the human cadaver and on the dog.

Only a limited number of pupils can be accepted.

Fee: 500 francs

A certificate, signed by the Professor and the Dean of the Faculty of Medicine of Paris, will be given after each course to every doctor who has attended it regularly.

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### The King of Sweden's Birthday Present

It is estimated that the King of Sweden's seventieth Birthday Gift Fund, which, by his Majesty's wish, is to be applied to cancer treatment and research, already amounts to £300,000. An interesting contribution to the fund was the £300 received from the Quillayote tribe of North American Indians, of which Prince William of Sweden, Duke of Sudermania, was made a chief, with the title of "Lone Eagle," during his recent lecture tour in the United States.

# Book Reviews

**Creatine and Creatinine.** Andrew Hunter, M.A., M.B., F.R.S.C., Professor of Biochemistry in the University of Toronto. 281 pp. 14 shillings. Longmans, Green & Co., Ltd., London, New York, Toronto, Calcutta, Bombay, and Madras, 1928.

Biochemistry, although the most recent division of science, is already amongst those possessing a most prolific literature. It is impossible for any biochemist, let alone others interested in biochemistry, to read the whole of the literature of the subject. Monographs dealing authoritatively with different phases are therefore obviously a necessity. The series of monographs edited by Dr. Plimmer and Sir F. G. Hopkins is the earliest and most complete of such attempts to cover the subject, and the present volume is a valuable addition to it.

Creatine and creatinine, the one a constant and important constituent of muscle, the other a constant and important constituent of urine, have long provided puzzles to biochemist and physiologist, both as to the source of creatine, and its function whereby creatinine is formed as an excretory product. These puzzles have in large part still to be solved, although the recent discovery that creatinine exists in muscle mainly as a creatine-phosphoric acid of peculiar constitution, whose dissociation and recombination are intimately connected with muscle function, suggests that more complete solutions of the puzzles will shortly be forthcoming. Although this work is so recent that only a brief mention of it in an addendum was possible in Dr. Hunter's book, yet anyone wishing to appreciate its significance properly, and to watch with understanding the unravelling of these important problems, will find the work a necessity.

The book consists of nine chapters, four devoted to an accurate statement of the known chemical facts and the biological distribution of creatine and creatinine, and the remainder to a cautious and critical but fair survey of the facts concerning the metabolism of these compounds, and the various theories that have been put forward concerning this metabolism and their function. A complete bibliography is appended.

The book is of course an essential addition to the library of the biochemist. Others interested in biochemical problems will find in it a clearly written and interesting account of an important phase of the chemical processes of the living organism.

A. T. CAMERON

**Atlas of Human Anatomy.** Dr. Johannes Sobotta. Edited from the Sixth German edition by J. Playfair McMurrich. Vols. I, II, and III. Profusely illustrated. Price for set of three volumes, $15.00. G. E. Stechert & Co., New York, 1928.

An atlas of human anatomy should aim at supplying a great number of clear original illustrations which can be used for revision work by the student of anatomy and for reference work by the practising surgeon. These two points of view are not coincident. The student requires accurate pictures approximating at times to almost diagrammatic clarity. The surgeon on the other hand wants a representation of a dissection which will be an accurate guide to him in his operative work, in other words a life-like picture. To adhere rigidly to one ideal would depreciate the value of the book for the other class of worker. The artist who executed the illustrations has succeeded in steering skillfully between the blackboard diagram on one hand and a photographic print on the other. The text which accompanied the original English edition has been pruned, leaving but a reasonable amount of descriptive matter to explain the plates.

It is refreshing to see that the editor has adhered to the B.N.A. as the nomenclature for the book. While one must admit that in places the terminology is cumbersome, there can be no doubt that it has made possible the accurate interpretation of anatomical descriptions in other languages. It seems a great pity that this rational and international nomenclature has not been adopted by many clinical teachers in this and in other countries. Whether this is due to the inertia of age or the conservatism which often ensues after years of didactic teaching, it would be vain to speculate.

J. BEATTIE

**Manual of the Practice of Medicine.** A. A. Stevens, A.M., M.D. 12th edition. 657 pages. Price $3.50. London and Philadelphia, W. B. Saunders Co.; Toronto, McAinsh & Co., 1928.

Any publication of this nature which has reached the twelfth edition must meet the hearty approval of a large number of medical readers. It is prepared especially for students but is also a handy book of reference for the general practitioner, being relatively brief but inclusive in its treatment of medical conditions.

There is a chapter at the end of the book dealing briefly with skin diseases, as well as a preceding section on diseases of the nervous system.

C. E. BROWN

**Ophthalmoscopy, Retinoscopy and Refraction.** W. A. Fisher, M.D., F.A.C.S. Second edition revised. 291 pages, 260 illustrations. Price $4.25. F. A. Davis Co., Philadelphia, 1927.

The author has made a sincere and painstaking attempt to condense into a short book, for the benefit of the student and the general practitioner, the three difficult subjects of ophthalmoscopy, retinoscopy and refraction.

The first half of the book deals with the various ocular diseases and their recognition by means of the ophthalmoscope. With the help of an ingenious invention of the author's, a tubular piece of wood representing the eye, and by the use of coloured pictures, the student is enabled, with the ophthalmoscope, to become familiar with the diseases of the fundus. There are some excellent coloured plates of the chief lesions of the fundus to be studied; and the notes to each plate are short and to the point. The author's method of writing in short paragraphs with headings in heavy type is effective for his purpose of teaching.

There is a chapter on the Field of Vision which every medical man would do well to familiarize himself with; and a helpful chapter on the systematic examination of the eye.

When one comes to the latter half of the book dealing with retinoscopy and refraction the reviewer confesses to a feeling of misgiving. The author begins by insisting that "The fitting of glasses," or in other words retinoscopy and refractions, is easy and belongs to the general practitioner. Whether one agrees with this view or disagrees, a very fair attempt is made to simplify and teach the exceedingly difficult and technical subject of refraction. Optical principles

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**WANTED**—Assistant doctor at Jordan Memorial Sanatorium, River Glade, N.B., to start work in the early fall. Prefer single man. Initial salary $125.00 per month with increases. New Infirmary building, 106 beds, x-ray equipment and laboratory. Please communicate with Superintendent, Jordan Memorial Sanatorium.

**FOR SALE**—Old established medical practice and property, about fifty miles from Toronto, on a highway. Owner would like to take up special work. Apply Box 88, C.M.A. Office, 3640 University Street, Montreal.

**WANTED**—Specialist in gynæcology and obstetrics for partnership in good Canadian city. State age, experience and qualifications and special training. All applications confidential. Box 89, C.M.A. Office, 3640 University St., Montreal.

**SHERNFOLD SCHOOL**, 72 Bronson Ave., Ottawa. A private residential school for girls requiring special training and care. Sister Virginia, S.S.J.D. (Church of England), Director.

are considered, the different kinds of lenses and their use described, with many pages of diagrams of the refractive errors, *viz.*, myopia, hyperopia, astigmatism, and presbyopia. The objective use of the retinoscope is described and finally the subjective test by means of the trial case of lenses, even to the fitting of the spectacles themselves.

Besides many coloured plates, the book is well illustrated with drawings and photographs. There might be less confusion to the student were the charts of the visual fields in chapter VI uniform, *i.e.*, all out lined in black.

There are some statements made that are obviously out of date, such as: "The use of cylinders in retinoscopy for the estimation of astigmatism is unnecessary." Professor Lindner of Vienna has shown that, on the contrary, the use of cylinders in this connection is of the utmost value. And again: "Cycloplegics are rarely, if ever, required in patients over forty years of age, and never in those over fifty."

There is an interesting chapter by Dr. Von Der Heydt on the examination by red-free light, the Gullstrand binocular ophthalmoscope, and the use of the slit lamp.

One can easily catch the enthusiasm of the author in his endeavour to equip the general practitioner with a valuable means of diagnosis of disease, *viz.*, the ophthalmoscope, but one cannot without difficulty go so far as to advise him (the busy practitioner) to add as well the tonometer, the perimeter, the retinoscope and the trial-frame.

S. O. MCMURTRY

**Transactions of the American Surgical Association.** Vol. xlv. Edited by John H. Jopson, M.D. William J. Doran Co., Philadelphia, 1927.

Like many of its predecessors, this volume of the "Transactions" presents the opinions of some of the most prominent surgeons of the present day on a wide variety of surgical conditions. Of the many sections of interest two deserve special mention—anæsthetics and thoracic surgery. The papers on these two subjects and, equally important, their discussion, gives the reader a fairly well balanced digest of present day surgical opinion.

L. H. MCKIM

**Health and Wealth, A Survey of the Economics of World Health.** Louis I. Dublin, Ph.D., 1928, Harper and Brothers, New York and London; 361 pp. with index.

This book represents a compilation of addresses and articles prepared by Dr. Dublin during the past five years. They are statistical in character but have been written in the popular style and for the lay mind. There are therefore, no references to coefficients of correlation, to probable errors, or to other statistical mysteries. For the physician there is a fund of useful information which is easily understood, for it must be remembered that from the standpoint of the statistician the physician is as much a layman as anyone.

Through all the fifteen chapters runs the theme of the prevention of disease. The great cost of disease is discussed and compared with the comparative cheapness of its prevention. From the great wealth of statistical data to which the author has access, material has been selected for strong essays on important social and public health problems of the day. The chapters on infant and child hygiene, on tuberculosis, and on the mortality of the negroes are very optimistic in tone; those on heart disease and cancer less so. The essay on birth control must have caused a disturbance in the ranks of the neomalthusians when it was first read at the Sixth International Neo-Malthusian and Birth Control Congress. Dr. Dublin apparently thinks that much of the propaganda for birth control is pernicious and does not hesitate to say so.

The chapter on prohibition gives small comfort to the protagonist of the Volstead Act. It is true that vital statistics have shown a striking reduction in mortality following the passage of the 18th Amendment, but this could as well be attributed to the influenza epidemics as to decrease in alcohol consumption. One would expect that the improvement in mortality, if due to prohibition, would become cumulative. It should not show its fullest effect at the beginning. The crude death rate of the United States Registration States of 1900 shows the most favourable year from the standpoint of mortality to be 1921, the year following the establishment of prohibition. Since that year the death rate has been rising slightly. When the crude death rate is dissected and specific rates according to age and sex are given, it is shown that the death rates of middle-aged and old males have been increasing very definitely since the low year, 1921. It is pointed out that the death rate from alcoholism has been constantly rising in the United States since the marked fall of early prohibition years. Deaths from alcoholism are now almost as frequent as they were ten years before the prohibition era. It is comforting to Canadian readers to know that the death rate from alcoholism in Canada, according to the experience of the Metropolitan Life Insurance Company, is only about a quarter of that in the United States.

In the final chapter, the author estimates a reasonable life-extension goal. Instead of the present expectancy of life at birth in the United States of approximately 58 years, he believes that a life expectancy of nearly 65 years is possible. Nor is this extension calculated solely on a saving of young lives. Dr. Dublin thinks that it is quite reasonable to expect an improvement in the life expectancy of old people. This improvement, it may be stated, does not appear to be taking place at the present time, but with the development of the practice of periodical examination it can be confidently hoped for.

FRANK G. PEDLEY

## BOOKS RECEIVED

**Surgical Clinics of North America,** vol. viii, No. 3. The Chicago Number. June, 1928. Philadelphia and London: W. B. Saunders Co. Toronto: McAinsh & Co.

**Sixteenth Annual Report of the United Fruit Company,** Boston, 1927.

**Traitement Biologique des Infections.** Dr. Albert Jentzer. 424 pages, illustrated. Masson & Co., Paris, 1928.

**Nouveau Précis de Bactériologie.** G. Delater and Ch. Grandclaude. 121 pages, illustrated. Gauthier-Villars & Co., Paris, 1928.

**Physics.** Catechism series. Part I. 3rd edition. 73 pages. Price 50 cents. The Macmillan Co. of Canada, Toronto, 1928.

**Introduction Biologique a l'Etude de la Neurologie et de la Psychopathologie.** 416 pages, illustrated. Price 80 francs. Librairie Felix Alcan, Paris, 1928.

**Transactions of the American Association of Genito-Urinary Surgeons.** Vol. xx. 347 pages, illustrated. Williams & Wilkins, Baltimore, 1927.

**Medical Clinics of North America,** vol. iii, No. 6. The Mayo Clinic Number. Philadelphia and London: W. B. Saunders Co. Toronto: McAinsh & Co., 1928.

**Mother. A Little Book for Men.** The Little Blue Book Series, issued by the Department of Health, Ottawa.

**The Twenty-Seventh Annual Report of the Canadian Tuberculosis Association, 1927.**

**Proceedings of the Sixth Canadian Conference on Child Welfare, 1927.** Published at Ottawa, 1928.

**Report of the Department of Health of Montreal, 1926,** by Dr. S. Boucher. Published by A. P. Pigeon, Ltd., Montreal, 1927.

**Report on the Health of the Army for the Year 1926.** Vol. lxii. Published by His Majesty's Stationery Office, London, 1928.

**Fifth Annual Report on Vital Statistics for the Dominion of Canada, 1925.** Published at Ottawa, 1927.